

Radiological  
Technologies  
University VT

# STUDENT HANDBOOK

**Volume 7, Effective June, 2016  
2015/2016**

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# Table of Contents

A Word from the President.....	5
Mission Statement .....	6
Indiana Code Requirement Statement .....	6
Accrediting Council for Independent Colleges and Schools.....	6
UNDERGRADUATE PROGRAM STUDENT HANDBOOK .....	7
Teaching Methodology.....	8
Hardware and Software Required by the Student .....	9
Non-Discrimination Policy.....	9
Degree Programs Offered.....	9
Average Class Size .....	9
ADMISSION POLICIES .....	10
Admission Procedure for Undergraduate Programs .....	10
Admission Requirements and Recommendations.....	11
Program Application Requirements.....	11
Program Admission Requirements .....	11
Application Requirements.....	11
Credit for Experiential Learning .....	12
Transfer of Credit.....	12
Grading System for undergraduate courses .....	13
ACADEMIC POLICIES .....	13
Student Academic Progress.....	13
NOTICE TO APPLICANTS.....	16
Attendance.....	18
Absences .....	19
Academic Integrity Policy.....	19
Students with Disabilities.....	20
Grievance Policy .....	20
Anti-Hazing Policy.....	20
Pregnancy Policy.....	21
Student Radiation Safety Policy: .....	22
Student Clinical Compensation and Hours Requirement Policy .....	22
Drug Free School and Workplace Policy.....	23
Dismissal.....	25
Student Records .....	25
Family Educational Rights and Privacy Act.....	25
Withdrawals .....	26
Transcripts.....	26
Tuition and Fees.....	26
FINANCIAL POLICIES .....	27
Payment.....	27
Tuition Payment Methods.....	27
Refunds .....	28
STUDENT SERVICES .....	29
Placement Services.....	29
Orientation.....	29
Books and Supplies.....	29
Hours of Operation.....	29
Contact Information .....	29

PROGRAM DESCRIPTIONS .....	30
<b>Bachelor of Science in Medical Dosimetry</b> .....	30
<b>Bachelor of Science in Radiation Therapy</b> .....	35
<b>Bachelor of Science in Medical Imaging with Specialization in Computed Tomography</b> .....	40
<b>Bachelor of Science in Medical Imaging with Specialization in Magnetic Resonance Imaging</b> .....	45
<b>Bachelor of Science in Medical Imaging with Specialization in Ultrasound</b> .....	49
<b>Bachelor of Science in Medical Imaging with Specialization in Nuclear Medicine/Positron     Emission Tomography</b> .....	53
UNIVERSITY STRUCTURE.....	59
Board of Directors.....	59
Administrative Control.....	59
RTU-VT COURSE CATALOG.....	61
Credit hour definition.....	61
UNDERGRADUATE COURSES DESCRIPTIONS.....	61
GRADUATE PROGRAM STUDENT HANDBOOK .....	85
Teaching Methodology.....	86
Hardware and Software Required by the Student .....	87
Non-Discrimination Policy.....	87
Degree Programs Offered.....	87
Average Class Size.....	87
ADMISSION POLICIES .....	87
Admission Procedure for Graduate Programs.....	88
Admission Requirements and Recommendations.....	88
Application Requirements:.....	88
Program Admission Requirements .....	89
Program Application Requirements.....	89
Program Admission Requirements .....	89
Grading System For Graduate level courses.....	90
Credit for Experiential Learning .....	91
Transfer of Credit.....	91
ACADEMIC POLICIES .....	92
Student Academic Progress.....	92
NOTICE TO APPLICANTS .....	95
Attendance.....	97
Absences .....	97
Academic Integrity Policy.....	97
Students with Disabilities.....	98
Grievance Policy .....	98
Anti-Hazing Policy.....	99
Pregnancy Policy.....	99
Student Radiation Safety Policy: .....	100
Student Clinical Compensation and Hours Requirement Policy .....	101
Drug Free School and Workplace Policy.....	101
Dismissal.....	103
Student Records .....	103
Family Educational Rights and Privacy Act .....	104
Withdrawals .....	104
Transcripts.....	105

Tuition and Fees .....	105
FINANCIAL POLICIES .....	105
Payment.....	106
Tuition Payment Methods .....	106
Refunds .....	106
STUDENT SERVICES .....	107
Placement Services.....	108
Orientation.....	108
Books and Supplies .....	108
Hours of Operation.....	108
Contact Information .....	108
PROGRAM DESCRIPTIONS .....	108
GRADUATE LEVEL PROGRAMS .....	109
<b>Masters in Medical Physics</b> .....	109
<b>Master of Medical Dosimetry</b> .....	111
<b>Masters in Medical Health Physics</b> .....	115
<b>Masters in Nanomedicine</b> .....	118
UNIVERSITY STRUCTURE.....	121
Board of Directors.....	121
Administrative Control.....	121
RTU-VT COURSE CATALOG.....	123
Credit hour definition.....	123
GRADUATE LEVEL COURSES DESCRIPTIONS .....	123
FACULTY AND STAFF ADDENDUM – Volume 7 (June 8, 2016).....	133
Faculty Listing .....	133
Staff Listing.....	134
Professional Services .....	134

## A Word from the President

Medical physics and medical dosimetry are not only very rewarding professions for someone interested in science and medicine, it is currently also a rapidly expanding profession. Students with a solid background in undergraduate physics and mathematics who decide upon a career in medical physics will find their studies of medical physics interesting and enjoyable, and their employment prospects, after completion of studies, excellent.

Medical physics is a branch of physics concerned with the application of physics to medicine, particularly in the diagnosis and treatment of human disease. The main areas of interest at present are in the treatment of cancer by ionizing radiation (radiation oncology), in diagnostic imaging with x-rays, ultrasound and nuclear magnetic resonance (diagnostic radiology), in diagnostic imaging with radionuclides (nuclear medicine) and in the study of radiation hazards and radiation protection (health physics). If people look to you for leadership, if you aspire to take the lead, or if you are responsible for leadership within your organization, we can help you to size up the challenges facing you. We can help you become a better leader.

Medical Dosimetry is designed to prepare students for the technical and theoretical aspects of a career in this field. Students acquire the professional skills of dose calculation, treatment design, and quality assurance through intensive classroom and clinical education under the supervision of educated, experienced Medical Dosimetrists, Physicists, and Radiation Oncologists.

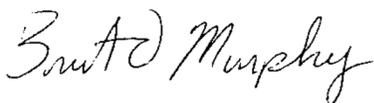
The Radiation Therapy program is designed to prepare students for the rapidly existing and emerging technologies in Radiation Oncology. Students acquire the professional skills of treatment delivery, specialty procedures, IMRT, SBRT, SRS, and IGRT. Students are also prepared for the environment of safety and technology in radiation oncology.

The Medical Imaging programs (CT, MRI, Nuclear Medicine, and Ultrasound) are designed to prepare students for the technical and professional aspects of this field. Students acquire the professional skills of imaging fundamentals, advanced imaging techniques, alternative imaging procedures, and leadership. Students are also prepared for the evolving regulatory and safety issues in the imaging disciplines.

Nanomedicine is a new and progressive field. The field is very fragmented in the United States and abroad. The nanomedicine program prepares students for this profession and focuses on nanomedicine, nanotechnology, medical physics, and imaging. The nanomedicine field is diverse and includes opportunities with hospitals, research institutions, vendors, pharmaceutical companies, and academia.

We can help you become a better leader. Radiological Technologies University invites you into an educational partnership that will empower you to reach your maximum professional capabilities.

With passion,



Brent Murphy, MS, DABR  
President

## **Mission Statement**

Radiological Technologies University strives to help students develop skills and competencies to enhance their career through personal involvement of students with faculty and staff toward achieving technical expertise for success.

### GUIDING OBJECTIVES

- ✓ Providing Students with higher educational and training opportunities that are flexible and accessible.
- ✓ Providing higher educational and training opportunities that are current with technology and career demands.
- ✓ Providing faculty members that have demonstrated expertise in their respective domain, both professionally and academically.
- ✓ Delivering educational support services that meet student life demands and schedules.
- ✓ Building within students a value for life-long learning and education.
- ✓ Teaching students how to evaluate, to analyze, and to synthesize information to become more skillful at creating solutions in a career environment.
- ✓ Providing educational resources in a manner that effectively uses current technology.
- ✓ Offering our programs at times and at places that are accessible to students--on campus, off campus, and at those sites best served by state of the art technologies.

## **Indiana Code Requirement Statement**

This institution is authorized by:  
Indiana Board for Proprietary Education  
101 West Ohio Street, Suite 670  
Indianapolis, IN 46204-1984  
317.464.4400 Ext. 138  
317.464.4400 Ext. 141

## **Accrediting Council for Independent Colleges and Schools**

Accredited by the Accrediting Council for Independent Colleges and Schools to award master's degrees. The Accrediting Council for Independent Colleges and Schools is listed as a nationally recognized accrediting agency by the United States Department of Education and is recognized by the Council for Higher Education Accreditation.

# UNDERGRADUATE PROGRAM STUDENT HANDBOOK

## 2015 – 2016 Academic Calendar

### Fall 2015

Application Due Date	August 10, 2015
Semester Start	September 7, 2015
Boot Camp Week	November 14-20, 2015
Fall Break	November 23-27, 2015
Semester End	December 18, 2015

### Spring 2016

Application Due Date	December 15, 2015
Semester Start	January 4, 2016
Boot Camp Week	March 14-20, 2016
Spring Break	March 21-25, 2016
Semester End	April 15, 2016

### Summer 2016

Application Due Date	April 11, 2016
Semester Start	May 9, 2016
Boot Camp Week	July 18-24, 2016
Summer Break	July 25-29, 2016
Semester End	August 19, 2016

### Fall 2016 Semester

Application Due Date	August 10, 2016
Semester Start	September 5, 2016
Boot Camp Week	November 12-18, 2016
Fall Break	November 21-25, 2016
Semester End	December 16, 2016

### Spring 2017 Semester

Application Due Date	December 15, 2016
Semester Start	January 9, 2017
Boot Camp Week	March 20-26, 2017
Spring Break	March 27-31, 2017
Semester End	April 21, 2017

### Summer 2017 Semester

Application Due Date	April 15, 2017
Semester Start	May 8, 2017
Boot Camp Week	July 17-23, 2017
Break Week	July 24-28, 2017
Semester End	August 18, 2017

## **Teaching Methodology**

The programs for RTU are designed to be completed in four semesters, which can run between 16 or 24 months depending on the students preference. Students who wish to pursue a more traditional route will generally enroll for fall and spring semester, which begin in September and January respectively. Students who wish to pursue an accelerated path may enroll in all three (fall, spring and summer) 15 week semesters and complete the program in roughly 16 to 18 months.

All programs require a Clinical Internship. The Clinical Internship is designed to be completed through a host site arranged by the student and university. Specific clinical internship requirements vary by program, but in all cases involve competencies that students must complete/observe as well as writing assignments based on their experiences.

Information on required textbooks and course material will be provided prior to the start of the course. Students are responsible for securing their required course materials unless otherwise stated. The syllabus for each course will be provided no later than the first day of the course.

RTU's course management system is used to manage communication and distribute all course material. The system allows students to communicate with other students, instructors, teacher's aides, and administrative personnel. During the semester, students are able to retrieve resources for classes, course material, weekly schedules and tasks, lecture videos and supplemental lecture material through the system.

Homework assignments and assessments can also be completed online through file upload features and interactive tests and quizzes. Progress reports and comments on assignments from instructors and teacher's aides are also available through the course management system. Students are required to attend weekly conferences via teleconference, webcast, or video chat with the instructor or instructor's assistant to aide them on course material, homework assignments, and weekly topics. Choice of delivery system is at the full discretion of the instructor.

Each semester, there is a schedule of offered courses along with the day and time required for each mandatory weekly discussion. If a course is scheduled on Thursday, this means that new material for that course will be available Thursday of each week. In addition, homework assignments and assessments will typically be scheduled for Thursdays. The syllabus for each course notes that these weekly schedules are subject to change.

To help students manage their personal and professional lives along with their course work, homework can usually be submitted until 11:59pm on the day the assignment is due. Assessments are scheduled ahead of time so the students can make allowances with their schedules. If the times allotted are an issue for a student that cannot be overcome, the student may address this with their instructor or the RTU administrator ahead of time so alternatives may be arranged.

It is the student's sole responsibility to make sure they are checking messages and announcements to ensure they are reviewing and completing all that is required of them. Administrative personnel, instructors, and teacher's aides make sure information is as visible and clear as possible. Open communication between the student and RTU is promoted to make sure there is no ambiguity.

Boot camp weeks scheduled during the fall, spring and summer semesters are designed to allow students to meet and work together in a classroom setting both with each other and the instructors. Boot camp weeks include events such as: exams, lectures, student project presentations, tours, lab

sessions for some courses, visiting lecturers, study sessions, and review sessions. Attending boot camp is mandatory.

RTU awards credit based on attendance, homework project submissions, and assessments. Graduate program courses require a minimum grade of 80% (B) in order to receive credit.

### **Hardware and Software Required by the Student**

- ✓ A computer with a minimum of a Pentium processor
- ✓ High-speed internet access
- ✓ Ability to stream flash videos
- ✓ Ability to read and create pdf files
- ✓ A minimum of Microsoft® Office 2003 or equivalent
- ✓ Email account
- ✓ Access to a scanner
- ✓ Access to a fax machine
- ✓ Access to a copier
- ✓ Access to a printer

### **Non-Discrimination Policy**

Radiological Technologies University is non-sectarian and does not discriminate with regard to race, creed, color, national origin, age, sex, disability or marital status in any of its academic course activities, employment practices, or admissions policies.

### **Degree Programs Offered**

#### **UNDERGRADUATE PROGRAMS**

Bachelor of Science in Medical Dosimetry	61 credits (121* total)
Bachelor of Science in Radiation Therapy	64 credits (124* total)
Bachelor of Science in Medical Imaging	
- Specialization in Magnetic Resonance Imaging	60 credits (120* total)
- Specialization in Ultrasound	60 credits (120* total)
- Specialization in Nuclear Medicine/PET	60 credits (120* total)
- Specialization in Computed Tomography	60 credits (120* total)

\*Total credits awarded for BS degree upon successful completion. 24 core credits and 36 general education credits must be accepted for transfer. There must be at least one general education course from each of the following categories: Humanities, Social Sciences, Sciences, and Mathematics.

### **Average Class Size**

Average class size at Radiological Technologies University is 5-10 which keep the classes small and intensive.

## **ADMISSION POLICIES**

A person's academic ability and potential for success at Radiological Technologies University are the most important factors in the school's admission decision. Full consideration is given to the applicant's academic achievement and aptitude, personal experiences, and motivation. The School does not discriminate on the basis of such factors as national or ethnic origin, race, color, age, gender, sexual orientation, marital status, religion, disability or veteran status.

Students that have submitted an application will receive full acceptance, no acceptance, or conditional acceptance. Conditional acceptance suggests the applicant will receive full acceptance once pre-requisites and/or graduate record examination scores are submitted. Students that have received conditional acceptance to the Medical Physics Program may receive full acceptance to the Master of Medical Dosimetry Program.

The accepted applicant for Masters level programs must possess a Bachelor's Degree from an accredited or approved institution or equivalent. Bachelor's Degree equivalency may be recognized if the student can show acceptable undergraduate college work through transcripts and extensive professional level, work experience, or more than four years of acceptable undergraduate college work.

International students (and U.S. students with international transcripts) must have a course by course evaluation of international transcripts by an approved private company, such as World Education Services, or other National Association of Credential Evaluation Services (NACES) to determine the equivalency.

Applicants whose first language is not English or language of the instruction is not English must submit English proficiency examination scores. The minimum TOEFL (Test of English as a Foreign Language) score required is 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The minimum IELTS (International English Language Testing System) score required is 6.5.

### **Admission Procedure for Undergraduate Programs**

Radiological Technologies University provides an application through their website. Applications can also be provided via email or fax upon request.

- 1) After the application and all required materials are received, the applicant will be notified within 7-10 days. Required Materials include:
  - ✓ Letters of reference
  - ✓ Official transcripts from all higher education institutions
  - ✓ Personal statement letter
  - ✓ Copies of TOEFL or IELTS scores, if applicable
  - ✓ Online application
  
- 2) After the applicant is notified, an interview will be scheduled with the President or Vice President of Academic Affairs and Academic Dean via phone conference.
  
- 3) Course selection, registration, and financing will take place during advising and registration sessions.

## **Admission Requirements and Recommendations**

### **UNDERGRADUATE PROGRAMS**

Bachelor in Medical Dosimetry, Bachelor of Radiation Therapy, and Bachelor of Science in Medical Imaging (Specializations in Computed Tomography, Ultrasound, Magnetic Resonance Imaging, and Nuclear Medicine/Positron Emission Tomography)

#### **Program Application Requirements**

- ✓ Letters of reference
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

#### **Program Admission Requirements**

- ✓ Associate of Science Degree, or equivalent credit hours in general education may be considered.
  - 24 Core credits will be accepted for transfer
  - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of the categories below:
    - Humanities
    - Social Sciences
    - Sciences
    - Mathematics
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Letters of References
- ✓ The student must either pass the MATH190 Placement Test or complete the MATH190 course

#### **Application Requirements**

- ✓ Application
- ✓ Official transcripts from all institutions of higher learning
- ✓ Curriculum Vitae/Résumé
- ✓ Three letters of reference that attest to academic and professional achievements
- ✓ TOEFL or IELTS scores (if your first language is not English)
- ✓ Application fee of \$35.00

Program requirements are part of the application process and must be completed prior to the start of the program. Recommendations are required in order to complete the program. They are not required prior to acceptance or program study.

### **Credit for Experiential Learning**

Radiological Technologies University does not grant any credit for prior experiential learning.

### **Transfer of Credit**

Radiological Technologies University may accept any course work successfully completed at other approved colleges and universities, if it comparably meets Radiological Technologies University course work requirements. A student may not transfer more than 25% of program classes. Classes must have a "C" or higher to be transferred. Graduate level classes below a "B" are not eligible for transfer to an RTU graduate program. RTU reserves the right to refuse credit transfers.

Should a student wish to transfer credit from Radiological Technologies University to another college or university, the student is advised to first contact the academic institution to which the transfer of credit is sought. All colleges and universities have their own policy regarding acceptances of transfer of credit.

### **Process for transfer of credit**

Students can find the transfer of credit form on-line or through administrative services. Students will need to provide RTU with a copy of the catalog description and support for evaluation. Once the student provides all need documentation the University President or the Vice President of Academic Affairs and Academic Dean will review the request for approval. Administrative services will contact the student with the acceptance or rejection of the transfer. **Transfer credits are not included in the cumulative GPA or cumulative program GPA calculation.**

All students applying for the Master degree program must arrange to have original transcripts sent to Radiological Technologies University. These arrangements are to be made at the time of the student's application. Upon receipt of these transcripts of college level course/degree completions, the University President or the Vice President of Academic Affairs and Academic Dean will review the documents and make the assessment of the transferability of each course appearing on the transcripts. Students desiring to transfer credits must fill out a Transfer of credit request and provide the supporting documentation. The Vice President of Academic Affairs and Academic Dean will review the request and notify student of decision within 30 days. As part of that assessment, the Vice President of Academic Affairs and Academic Dean will assure that the student's GPA meets or exceeds the minimum required.

Should the transcripts be from overseas, those documents will be photocopied. The copies will be retained by this institution. The originals will be forwarded, by mail, to an independent Transcript Evaluation Service. Upon return of the documents, the President or Vice President of Academic Affairs and Academic Dean will review the correspondence received from the Transcript Evaluation Service and return all received documents to the student's official file. At that time, the Administrator will respond, in writing, to the applicant and document either: the acceptance of the credit or will document the specific courses which are transferable, which are not, and what further action will be required of the student in order to meet the published academic entrance requirements for the selected degree program. Each document will be examined to assure that the work accepted is clearly indicated, by the issuing institution, to be degree appropriate coursework. Questions of the equivalency of credit from overseas institutions will be submitted to the Independent Transcript Evaluation Service. If evaluation is necessary by a third party the student will be responsible for payment of service.

## **Grading System for undergraduate courses**

### *Grade and Credit Point System*

The following grades are considered in computing semester or cumulative grade averages. Course hours with a grade of “F” are counted when computing grade point averages but do not count toward the earned hours required for degrees.

A	(4.0 Pts)	Excellent
B	(3.0 Pts)	Good
C	(2.0 Pts)	Satisfactory
D	(0.0 Pts)	Unsatisfactory
F	(0.0 Pts)	Failing
P	(4.0 Pts)	Passed (Pass/Fail Option)
WF	(0.0 Pts)	Withdrawn – Failing

### Repeated Courses

Repeated courses are counted in the Radiological Technologies University grade point average and may also be counted in the student’s primary program GPA (Student Program GPA), depending on the policies of the student’s program. Students must replace a failed grade, or a grade not meeting the minimum grade requirement. When students repeat a failed grade, the original grade will be replaced by the new grade and will be calculated in the cumulative GPA. Both grades are counted as attempted credits and calculated in SAP assessment.

The following grades are not considered in computing semester or cumulative grade point averages:

AU	Audit - No Credit
I	Incomplete/Pending
T	Denotes credits transferred from another Institution
W	Withdrawn

### Abbreviations and Symbols

EHRs	Credit hours earned
QPts	Quality Points Earned
GPA	Grade point average (computed by dividing QPts by EHRs)

### Credit Types

Regular Credit – All Radiological Technologies University credit is reported in terms of semester hours, whether earned during a 16-week semester or a summer session.

## **ACADEMIC POLICIES**

### **Student Academic Progress**

Details regarding the academic progress of each student are documented by the institution. All students must maintain minimum standards of satisfactory academic progress as measured by the student’s cumulative grade point average. The minimum acceptable GPA (grade point average) for undergraduate students is 2.0. Should an individual student’s grade point average fall below 2.0, the student will be placed on academic probation. During the ensuing enrollment sessions the student will receive remedial guidance from the President, Program Director, or Vice President of Academic Affairs and Academic Dean, and additional assignments or projects may be required to assure that the

student is benefiting from the instruction. The early identification of those students who are experiencing academic difficulty will assist the institution in providing the additional guidance that may provide a remedy. Students who do not meet minimum standards of satisfactory academic progress or demonstrate barriers to learning including social, emotional, and physical health deficits may be placed on Academic and/or Administrative Hold. This status is meant to work with the student and help them address their barriers to learning through time, counseling, or other means.

### **Standards of Satisfactory Academic Progress Policy and Procedures**

Radiological Technologies University has the following Standards of Satisfactory Academic Progress (SAP) Policy for all students. These standards require that a student make progress toward an undergraduate or graduate degree during all periods of enrollment.

#### **Minimum Standards of Satisfactory Academic Progress**

- ✓ Maintain required minimum cumulative Grade Point Average (GPA) or higher (a qualitative measure)
- ✓ Successfully complete at least 67% of the cumulative attempted credit hours (a quantitative measure) and
- ✓ Make positive progress toward a program of study within 150% of the published program length.

#### **Statuses of Academic Progress**

- 1) Satisfactory – Student is meeting the minimum academic standards or has no academic history.
- 2) Warning – Student did not meet minimum standards for cumulative GPA and/or 67% completion rate in the previous evaluation period. Student must reach all minimum standards by the end of the next evaluation period. This is also referred to as academic probation.
- 3) Unsatisfactory Progress – Student has had two consecutive evaluation periods below minimum standards for cumulative GPA and/or 67% completion rate. The student may face academic probation or dismissal. Two consecutive periods below minimum will require a meeting with the Vice President of Academic Affairs and Academic Dean or other designated person with possible dismissal from the program.
- 4) Timeframe – Student has attempted at least 180 credit hours toward a Bachelor's Degree. Graduate students must earn their degree within the timelines set by the Graduate School per their graduate program. If a student exceeds these credit hour limits, they are not making progress toward a degree within the 150% federal requirement. Student may be dismissed from the program.

When is Academic Progress Evaluated? A student's standards of satisfactory academic progress will be evaluated at the end of each academic semester (i.e., fall, spring, and summer semesters).

Successful completion of an undergraduate class is defined as earning a grade of A, B, C, or Pass. Unsuccessful grades are D, F, W, Fail, or Incomplete.

Successful completion of a graduate class is defined as earning a grade of A, B, or Pass. Unsuccessful grades are C, D, F, W, Fail, or Incomplete.

Transfer Students and Transfer credit hours: Students transferring to RTU are required to have all prior college transcripts evaluated for transfer credits. All credit hours accepted by RTU will be used to determine 67% completion rate and maximum timeframe of 150%.

Remedial/Repeat Courses: All remedial and repeat courses will be used in determining completion rate and timeframe. Actual letter grades are not included in the cumulative GPA.

Audited Credit Hours: Courses taken on an audit basis are not counted when determining the completion percentage or for purposes of determining your cumulative GPA.

In order to calculate your total ATTEMPTED hours IF you have courses on your transcript with a grade of "W" (Withdrawal), "F" (Fail), "FA" (Failure to Attend) or "I" (Incomplete) you will need to account for those credits in your total attempted hours per federal regulation. A minimum of 3 (three) credit hours should be counted for EACH class that was withdrawn, failed, failure to attend, or incomplete and ADD the total number to "Total Earned Credits" on your transcript in order to determine total attempted hours.

For example, student has 2 grades of "W" (6 credit hours), 1 grade of "F" (3 credit hours), 3 grades of "I" (9 credit hours), and one grade of "I" (3 credit hours) and the bottom of the transcript shows "Total Earned Credits" of 80. To calculate total attempted credits, add  $(6+3+9+3)+80=101$  total attempted credit hours.

To calculate completion rate, take total EARNED credit hours and divide by total ATTEMPTED hours. For example:  $80/101=79\%$ .

"Cumulative GPA" (must meet SAP minimum GPA requirements).

If you are unable to determine your SAP status, visit or call Administrative services at 574-232-2408 for assistance.

#### Resolving Incomplete Grades

The school incorporates an "I" for incomplete courses within the listed academic policies above. The School's policy is that incomplete grades must be completed and a grade reported no more than five (5) semesters of active enrollment after the term the incomplete grade was earned. If the student does not resolve the incomplete grade, it becomes the responsibility of the School to assign a punitive grade of "F".

#### How to Re-establish Satisfactory Standing

A student must bring his/her GPA and completion rate up to the minimum standards of the required cumulative GPA, per matrix, and 67% completion rate.

#### Appeal process for SAP

Mitigating Circumstances: If a student has experienced mitigating circumstances (illness, job related, family illness, change of major) during the most recent evaluation period, they may submit an Appeal. Appeal forms are available on the website. The student must also submit supporting documentation with the appeal form. If the request is granted, the student will be placed on one of two Statuses:

- 1) Probation – The student is expected to improve to minimum standards by the end of the next evaluation period. The student must meet minimum standards by the next evaluation period. A student cannot be on probation for two consecutive semesters.
- 2) Academic Success Plan – The student cannot be expected to improve to minimum standards by the next evaluation period. The student and RTU have agreed to a success plan to allow the student to meet minimum standards within a fixed number of evaluation periods. If at any time the student stops following the success plan and they are not meeting minimum standards they will become Ineligible for program completion. If a student meets minimum standards at any time while on a success plan their Status will be updated to Eligible.

If the request is not granted, the student will remain Ineligible until they meet all minimum standards.

**Timeframe Mitigating Circumstances:** If a student has not completed their program of study within the 150% timeframe and there are mitigating circumstances (illness, job related, family illness, change of major), they may submit an Appeal to be on a Not Enrolled; Pending status. If this application is granted, the student will be placed on the following Academic Eligibility Status:

**Timeframe Academic Success Plan –** The student and RTU have agreed to a success plan that they must follow. If at any time the student stops following the success plan, they may face dismissal from the program.

If the request is not granted, the student may be withdrawn from the program. All students are limited to one Timeframe Academic Success Plan.

Probation and dismissal actions are processed uniformly without regard to race, color, sex, religion, age, disability and national origin, as defined by law. In the event a student disagrees with the application of these standards of satisfactory academic progress, a written appeal may be filed with the Vice President of Academic Affairs and Academic Dean.

## **NOTICE TO APPLICANTS**

### **Student Financial Assistance Programs Disclosure of Social Security Account Number**

Section 7(a) of the Privacy Act of 1974 (5U.S.C.552a) requires that when any federal, state, or local government agency requests an individual to disclose his or her Social Security Account Number, that individual must also be advised whether that disclosure is mandatory or voluntary, by what statutory or other authority the number is solicited, and what use will be made of it. Accordingly, applicants are advised that disclosure of the applicant's Social Security Account Number (SSAN) is required as a condition for participation in student financial assistance programs sponsored by the federal government, state, or the local government, in view of the practical administrative difficulties that would be encountered in maintaining adequate program records without the continued use of the SSAN. The SSAN will be used to verify the identity of the applicant and as an account number (identifier) throughout the life of the loan or other type of assistance in order to report necessary data accurately. As an identifier, the SSAN is used in such program activities as determining program eligibility, certifying school attendance and student status, determining eligibility for deferment or

repayment of student loans, and for tracing and collecting in cases of defaulted loans. Authority for requiring the disclosure of an applicant's SSAN is grounded on Section 7(a)(2) of the Privacy Act, which provides that an agency may continue to require disclosure of an individual's SSAN as a condition for the granting of a right, benefit, or privilege provided by law where the agency required this disclosure under statute or regulation prior to Jan. 1, 1975, in order to verify the identity of an individual.

### **Program Completion**

The institution's policy on program completion is developed to ensure student progress through the program in a timely manner. Students must complete the program of study within 150% of the normal program length, as defined by the institution and must meet the program objectives. Students may be listed as Not Enrolled; pending by the President or the Vice President of Academic Affairs and Academic Dean under the following conditions: student is awaiting accreditation, student has endured extraordinary personal hardship, or the student experiences delays from their clinical internship site that the student and University are unable to prevent. Students that have been granted this status are expected to maintain good communications with RTU. Program students will meet at least yearly with an RTU staff member/faculty member during boot camp to review their progress in the program. For students that require additional undergraduate courses for program completion, the program time will be adjusted based on number of credit hours needed.

### **Change of Program**

Students desiring to change programs of study must meet with the President or Vice President of Academic Affairs and Academic Dean to complete the appropriate documentation. The new program will have different Standards of Satisfactory Academic Progress and will be discussed during this meeting.

A maximum of three program changes may be made during a student's attendance at Radiological Technologies University-VT. Program completion time may be extended due to scheduling conflicts or the additional credit hours required for the new program. Students transferring to a new program will have applicable credit attempted and earned applied to the new program based on requirements of the new program.

### **Multiple Majors**

Students often decide to pursue more than one major because many courses are applicable to more than one program. Additional time is required to complete the required courses for a multiple major, and additional costs are incurred. Students wishing to take advantage of this opportunity must meet with the Program Director or Administrator to complete the appropriate forms. Students who choose to pursue multiple majors may utilize the courses requirements in one major to fulfill the elective requirements in another.

### **Counseling**

Academic: Students are encouraged to seek academic counsel from the faculty members, and Administrator - not only during registration periods but also during the academic year when problems and questions arise.

Admissions: Prospective students of the college are interviewed by an Admissions Representative to make sure their career objectives can be served by the college's academic resources. Those persons whose objectives cannot be served by the programs of the college are advised to seek other educational institutions that offer programs more aligned to their fields of interest.

Employment: RTU graduate placement support begins the first semester the student enters the program. Students are informed of opportunities in the industry during boot camp weeks and encouraged to be active with early networking. RTU meets with every student during boot camp weeks and discusses employment opportunities and placement opportunities. Students have access to faculty to assist with résumé writing, résumé reviews, rehearsing interviews, and coaching. RTU faculty are actively engaged with students and connecting them with opportunities through professional associations and relationships. RTU is evaluating other mechanisms to increase the student's exposure to employers. Graduate employment is very important to RTU.

Financial Assistance: Students may seek counseling from Administrative Services to manage financial arrangements.

Personal: Students and potential students are welcome and encouraged to seek assistance from any member of the staff or faculty regarding professional, personal, financial, and /or admissions counseling when issues arise that have a negative effect on their ability to do their best work at Radiological Technologies University. When appropriate, students are referred to outside agencies or professionals for support or assistance. Through our on line program student are given access to counseling services through [www.wellconnectbysrs.com](http://www.wellconnectbysrs.com). This website provides information, tools and support to address barriers to their success. Comprehensive student services are based on an individualized service. Students have access 24/7 to telephone counseling for students in crisis, assessment and students.

### **Student Resource Services**

All students also have access to the Student Resource Services (SRS) website ([www.wellconnectbysrs.com](http://www.wellconnectbysrs.com)) for information, tools, and support to address barriers to their success. Comprehensive student services are based on an individualized service plan and include:

- ✓ Unlimited 24-7 telephone counseling response to any covered students in crisis, assessment and students needing additional support or identifying new needs/requests;
- ✓ Telephone counseling/life coaching (1-5 telephone counseling hours) from a licensed mental health professional;
- ✓ Individualized resource searches for all covered students, focused on issues that impede student success, including special adjustment needs by specific populations such as returning veterans;
- ✓ Telephone consultations for all covered students with an attorney or financial expert;
- ✓ Follow-up and outreach with the student until all issues are resolved sufficiently that the student can be successful in personal and school goals;
- ✓ Staff/faculty formal referral of students with intensive needs;
- ✓ Faculty consultation on any student concerns that would impede that student from being successful.

### **Attendance**

This institution's policy on attendance is based on the premise that regular communication between the teacher and the student and, also, among students themselves, has significant value in the learning

process. Our programs are structured to maximize your interaction with your instructor and peers while maintaining autonomy over your academic schedule. Therefore, each student is afforded the freedom to establish his or her schedule, but regular contact with the instructor/ teaching assistant and other enrolled students is a requirement that must be met. Such contact will help guide and maintain your steady progress towards the completion of assignments and courses. Such contact better assures we may more readily assist you in resolving any problematic aspects of your program. Instructors are authorized to factor the frequency and adequacy of your communications into the assignment of a grade for any given course.

Attendance at semester boot camp is mandatory for all program students. Students will be issued an incomplete if the student fails to attend boot camp.

### **Absences**

Allowances for interruptions in "attendance" due to illness or personal emergency should be handled on a case-by-case basis between the student and instructor. Arrangements to make up work missed and return to an agreed schedule should be initiated by the student and established with the instructor. Absences may be granted for good reasons at the discretion of the University. Students are required to submit a written request for any extended leave of absence.

Frequent absences during a course could be grounds for dismissal. Students will be contacted and counseled before significant measures are taken. Plans will be made for make-up work should it be warranted. RTU's course management system tracks the student's activities. This student activity log is used to verify class attendance.

### **Academic Integrity Policy**

RTU has a zero tolerance policy. Integrity is a foundational concept of professional behavior and RTU takes such matters very seriously. In general, if you have to ask if behavior would violate the integrity policy, it probably does.

RTU is committed to educate, implement, support, and enforce sound academic and professional integrity.

#### **Collaboration Defined**

- ✓ Working together on assignments and projects
- ✓ Citing literature

#### **Cheating Defined**

- ✓ Not doing the work
- ✓ Not doing the work and directly copying

If academic dishonesty is suspected, the information will be documented and brought before the President for review. The student or students will be notified that there is a suspicion of academic dishonesty and an investigation will follow. Information retrieved during the investigation process will be evaluated and the student or students involved will be informed of the result.

In the event that academic dishonesty is validated during the investigation process, the individual or individuals involved will be notified of any action RTU chooses to take.

Typically, a first offense will result in the individual or individuals receiving probationary status or dismissal.

### **Students with Disabilities**

If you feel you have a disability and need special accommodations of any nature whatsoever, please communicate them with the Director of Administrative Services before or during the first week of classes. The Director of Administrative Services will inform faculty as needed and the faculty member will make every effort to provide reasonable accommodations to ensure that you have a fair opportunity to perform in your course work.

### **Grievance Policy**

**First Step**-Anyone with a grievance or complaint may request an individual conference with the instructor or staff member to discuss the matter.

**Second Step**-If a satisfactory resolution to the problem is not reached, the aggrieved party should seek guidance from the Director.

**Third Step**-If the grievance is not resolved within 5 days of the incident, the aggrieved party must present to the Director, in writing, all facts of the grievance.

Within 48 hours, upon receipt of the written information, the Director will schedule a Grievance Committee hearing. The time of the meeting will be communicated in writing to all parties. The committee will consist of the Vice President of Academic Affairs and Academic Dean and two staff or faculty members not involved with the incident in question.

All Persons or their representatives involved with the incident must be present via teleconference at the time of the hearing. All parties involved will be given the opportunity to discuss the grievance. The Grievance Committee will excuse all parties involved in the grievance and immediately review and conclude the case. The decision of the committee will be communicated to those involved in the incident within 48 hours. The committee decision will be final.

The Accrediting Council for Independent Colleges and Schools (ACICS) provides complaint procedures for the filing of complaints against accredited institutions. ACICS requires that the complainant have exhausted all complaint and grievance procedures provided under the institutional policy. Should such a complaint be filed, ACICS will review the matter to determine whether there may have been any violation of its criteria and standards, and can take action only if it determines there to have been such a violation. ACICS can be contacted at 750 First Street, NE, Suite 980, Washington, DC 20002, (202) 336-6780.

### **Anti-Hazing Policy**

RTU is dedicated to promoting a safe and healthy campus environment for its students, faculty, staff and visitors. In addition, RTU is committed to promoting an environment that fosters respect for the dignity and rights of all its community members. As such, the University will not tolerate hazing activities by any individuals, groups, or recognized student organizations.

Hazing poses substantial risks to the safety and well-being of individual students and the University community. As such, violations of this policy will result in referral to the Office of Administration and possible disciplinary action which may include, but not be limited to, any or all of the following: suspension or expulsion from the University, loss of University recognition and privileges, referral to

law enforcement, inability to participate in educational programs, and other educational or remedial action appropriate to the circumstances.

### **Pregnancy Policy**

Students should understand that a pregnancy during the AS to BS Medical Dosimetry program may have an impact on their education and possibly upon the timing of graduation. Two important factors are involved.

1. Courses are only offered at select times each year and time missed for pregnancy and/or delivery will likely necessitate make up work or perhaps delay of up to a year to maintain the proper sequence of courses, depending on the timing and amount of time missed.
2. There are potential risks to an embryo or fetus secondary to radiation exposure that may require counseling and alteration of the clinical education experience.

The following policy has been developed to guide the program and its students in the event of a student pregnancy.

- A. Female students are asked to read The U. S. Nuclear Regulatory Commission Regulatory Guide 8.13 regarding [“Possible Health Risks to Children of Women Who are Exposed to Radiation During Pregnancy”](#) as well as the pregnancy policy and complete and return the associated form. This document can be found at: <http://pbadupws.nrc.gov/docs/ML0037/ML003739505.pdf>.
- B. All students will be made aware of risks and hazards of prenatal radiation exposure during coursework at RTU and upon orientation to the clinical internship.
- C. A student who is pregnant, or suspects that she may be, has the option to voluntarily declare that condition to program officials.
  - a. If the student decides to declare the pregnancy it shall be done in writing to the Program Director and/or the Clinical Supervisor of her internship site. The notification shall also include the expected date of delivery.
  - b. A student may reverse their pregnancy declaration at any time. This option is voluntary and the reversal must be provided in writing to the Program Director and/or the Clinical Supervisor of her internship site.
  - c. The program will comply with student confidentiality requests as much as possible.
- D. If a student chooses to declare a pregnancy, a counseling session will be set up with the radiation safety officer at the student’s clinical internship site to review radiation exposure risks and any additional monitoring practices which may be initiated.
- E. A declared pregnant student may choose one of the options below (or may choose to change to a different option at a later time if desired, with written notice):
  - a. Take a leave of absence from the program. (See policy for leave of absence.) Should the declared pregnant student decide to leave the program during pregnancy and delivery, tuition will be refunded according to the Tuition Refund Policy. In this circumstance the student would be readmitted to the program at the first available opening after delivery.
  - b. Stay in the program, but make modifications in her clinical rotation schedules to reduce the chance of exposure to the fetus.
    - i. For example, she will not participate in site specific rotations as recommended by the Radiation Safety Officer during the time of the pregnancy. Competency and experience in all required areas will be made up following delivery. This could delay graduation beyond the originally expected date.

- c. Stay in the program and/or internship during pregnancy and continue the program without modification of learning activities or clinical rotations. If she decides to do this, she does so in full knowledge of the potential hazard of embryo/fetal radiation exposure.
  - i. It is recommended that the student consult their personal physician should they choose this option. The student must also indicate, in writing her intention to continue the program without modification. A copy of this document will be kept in the student's file.

Should delivery occur during clinical internship, all course work and clinical time must be completed before the student is eligible for graduation.

#### **Student Radiation Safety Policy:**

- A. Students entering the clinical setting for their internship must receive orientation to radiation safety practices and requirements by the Radiation Safety Officer.
- B. A radiation monitoring badge must be worn by the student at all time while in the department.
- C. Students assisting in the simulator and treatment units must never be in the room during exposure to treatments
- D. Students working in brachytherapy must remember and put to use techniques of time, distance, and shielding.
- E. Radiation exposure levels will be monitored by the University RSO. If a student's radiation exposure reading exceeds 30 mrem on a single report, the program director must be informed immediately. The RSO and program director will investigate the reason for the reading and determine an action plan within 10 days to ensure that the student follows ALARA principles.
- F. If the student exceeds the trigger dose limit (30 mrem) on any personal monitoring report, the student must be removed from the clinical setting and counseled immediately by the university RSO, Program Director, and Clinical Coordinator on how to avoid further exposure.
- G. Notification: Dosimetry reports will be received by the Clinical Preceptor at the site. The Clinical Preceptor will provide the individualized dosimetry report to each student. No personal information will be visible to individuals other than the one named on the report. The student will sign the dosimetry report and a copy will be sent to Radiological Technologies University.

#### **Student Clinical Compensation and Hours Requirement Policy**

Students entering the clinical setting for their internship are only required to work twelve (12) hours per week and for no more than ten (10) hours per day.

Medical Physics Program: The minimum required hours for the Clinical Internship is one hundred eighty hours (180).

Medical Dosimetry Programs: The minimum required hours for the Clinical Internship is seven hundred twenty hours (720). For students who enrolled in their program of study prior to January 4, 2016, the minimum required hours for the Clinical Internship is one hundred eighty hours (180).

The student is entitled to no compensation while performing competencies for the clinical internship. Any extra hours the student chooses to spend are purely voluntary and the student is entitled to no compensation or extra credit of any kind.

## **Drug Free School and Workplace Policy**

### **A. Scope**

This policy applies to all students, employees, and invitees on university premises or while conducting university business off university premises.

### **B. Policy Statement**

1. The university absolutely prohibits the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance or alcohol on university premises or while conducting university business off university premises. Violation of this policy may result in immediate termination of employment.
2. In compliance with the Drug-Free Workplace Act of 1988 and the federal Drug-Free Schools and Communities Act Amendments of 1989, and as a condition of employment with Radiological Technologies University, all employees must:
  - a. Abide by the prohibition in point 1. (See above)
  - b. Notify the Director of Administrative Services for the campus of any conviction under a criminal drug statute for violations occurring on or off university premises while conducting university business, within 5 days of the conviction.
    - i. When the Director of Administrative Services receives notice of such a conviction, it will coordinate efforts to comply with the reporting requirements of the Drug-Free Workplace Act of 1988.
3. An employee who is (1) found to be under the influence of alcohol or a controlled substance while on university property, or in the course of a university activity, or (2) convicted of a criminal alcohol or drug statute violation occurring on university property, is subject to disciplinary action, up to and including termination.
  - a. An employee is determined to be under the influence according to the standard set by the applicable standard (e.g., Department of Transportation, Indiana law).
  - b. It is lawful for an individual to be under the influence of a controlled substance in a public place if the individual can present positive proof of the following:
    - i. The individual is under the care of the Bureau of Addiction Services, a community mental health center, a managed care provider, or a licensed physician.
    - ii. The controlled substance constitutes medical treatment authorized by state and federal law.

### **C. Reason for Policy**

1. To promote a safe, healthy working environment for all employees
2. To provide assistance toward rehabilitation for any employee who seeks help in overcoming an addiction or dependence on alcohol or drugs
3. To reduce the incidence of injury to person or property and to reduce absenteeism, tardiness, and poor job performance

### **D. Procedures**

1. When it is reasonably believed that an employee is under the influence of drugs or alcohol while on the job, contact the Director of Administrative Services to implement the following guidelines—all of which must be applied in accordance with the applicable Corrective Action policy.

- a. The employee may be removed from the workplace until the employee is no longer under the influence and during the time an investigation is underway. In such circumstances, the supervisor will arrange to have the employee transported home.
  - b. The employee may be required to undergo drug or alcohol testing. This could occur both at the time the employee is suspected of being under the influence and/or before the employee is allowed to return to work as evidence the employee is no longer under the influence.
    - i. An employee's refusal to participate in requested drug and/or alcohol testing is a separate offense subject to corrective action.
  - c. An employee found to be under the influence is subject to discipline as provided in the Corrective Action policy.
  - d. The supervisor may counsel the employee to seek assistance.
  - e. Job performance problems are subject to the steps of the Corrective Action policy.
2. Assistance and rehabilitation
- a. Employees requiring assistance in dealing with the use of alcohol or a controlled substance can receive such assistance in two ways: self-referral and university referral.
  - b. Employees are encouraged to seek confidential information and referral assistance from the following:
    - i. List of local social service agencies. Employees are advised to check with their medical plan administrator for coverage information.

#### D. Definitions

Controlled substances are those usually referred to as illegal drugs listed under the federal Controlled Substances Act.

#### F. Sanctions

- 1. All employees are reminded that conviction under state and federal laws that prohibit alcohol and drug-related conduct can result in fines, confiscation of automobiles and other property, and imprisonment. A conviction can also result in the loss of a license to drive or to practice in certain professions, and barred opportunities from employment.
- 2. A person who exhibits alcohol-related behavior such as the following is at risk of arrest:
  - a. A person under 21 who possesses alcohol
  - b. A person who provides alcohol to a person under 21
  - c. A person who is intoxicated in public
  - d. A person who sells alcohol beverages without a license

#### G. Related Information

- 1. All persons should be aware of the following health risks caused by alcohol:
  - a. Consumption of more than two average servings of alcohol in several hours can impair coordination and reasoning, and make driving an unsafe activity.
  - b. Consumption of alcohol by a pregnant woman can damage the unborn child. A pregnant woman should consult her physician about this risk.
  - c. Regular and heavy alcohol consumption can cause serious health problems such as damage to the liver and to the nervous and circulatory systems.
  - d. Drinking large amounts of alcohol in a short time may quickly produce unconsciousness, coma, and even death.
- 2. The health risks associated with controlled substances are numerous and varied depending on the drug. Nonetheless, the use of drugs not prescribed by a physician are harmful to the health. For example, drug use can cause the following conditions:

- a. Impaired short-term memory or comprehension
- b. Anxiety, delusions, and hallucinations
- c. Loss of appetite resulting in damage to one's long-term health
- d. A drug-dependent newborn, if the mother uses drugs during pregnancy
  - i. Pregnant women who use alcohol or drugs, or who smoke should consult their physician.
- e. AIDS, as a result of drug users who share needles
- f. Death from overdose

### **Dismissal**

Radiological Technologies University reserves the right to dismiss any student from the program for any of the following reasons:

- ✓ Non-compliance of the rules and regulations of Radiological Technologies University
- ✓ Engagement in any illegal or criminal act
- ✓ Any conduct that brings discredit or embarrassment to Radiological Technologies University
- ✓ Failure to meet standards of satisfactory academic progress
- ✓ Failure to meet ones financial obligations to Radiological Technologies University

### **Student Records**

All documentation and records pertaining to students are held in strict confidence as accorded by law. It is also an ethical standard of Radiological Technology University to do so. Student records will be retained indefinitely (and safely) by this institution.

Student records are available for release to third parties upon the student's written request, a court order, or an oversight agency's requirement.

### **Family Educational Rights and Privacy Act**

All students enrolled at Radiological Technologies University-VT shall have the right to inspect and review their educational records, to request corrections and deletions, and to limit disclosure with the Family Educational Rights and Privacy Act of 1974. The procedure for exercising these rights is available to students upon request at the office of the Executive Director.

Student records are kept on file in an appropriate and secure location. They are confidential and are available for approved purposes only by authorized employees. In accordance with the Family Educational Rights and Privacy Act of 1974, the college will not release educational records to unauthorized persons without the prior written consent of the student or parent/legal guardian if the student is less than 18 years of age.

The Family Educational Rights and Privacy Act of 1974 was designed to protect the privacy of educational records, establish the right of students to inspect and review their educational records, and provide guidelines for correction of inaccurate or misleading data through informal and formal hearings. Students also have the right to file complaints with the Family Educational Rights and Privacy Act (FERPA) Office concerning alleged failures by the school to comply with the Act.

NOTICE: Radiological Technologies University-VT will generally release certain directory information pertaining to its students to the public. This information may include student's name, address(es), phone number, program, dates of attendance, photographs, post- graduation employer and job title, participation in activities and recognition record, and the secondary and postsecondary educational institution attended by the student. If students prefer that any of this information may not be released by Radiological Technologies University-VT, they may make that request in writing, and Radiological Technology University – VT will honor it.

### **Drop/ Add Period**

Courses dropped during the first week of the semester will not appear on the student's transcript and students will not be charged tuition for those courses. Courses dropped during the second through seventh week of any semester will appear on the student's transcript with a grade of "W". Any course dropped after the seventh week of the semester will appear on the student's transcript with a grade of "WF". Tuition refunds will follow the stated refund policy of RTU.

Students may choose to add a subject to their schedule only during the first week of the semester. The addition of one or more courses may affect the tuition due.

### **Withdrawals**

We hope it will not be necessary for you to withdraw; but if circumstances cause you to consider doing so, please discuss any problems with us before making that decision. We are often able to provide assistance that enables students to remain in college.

If you must withdraw, an exit interview with the Administrator or Administrative services is required. During this meeting, you will discuss tuition due, refunds or outstanding debts. Students who withdraw from class will receive an appropriate grade as outlines in the section entitled Drop/Add Period. Upon returning, students will be required to repeat the class and will be responsible for any additional expenses.

### **Transcripts**

Upon written request by the student, Radiological Technologies University will prepare and forward a transcript of the student's record. All requests must include the student's full name, a statement requesting a transcript be issued, the address to which the student would like the transcript sent, and a release signature. Official transcripts will only be released if the student is in good standing with the academic office. Transcripts are sent free of charge within two weeks of the date the request was received.

### **Tuition and Fees**

Radiological Technologies University charges a fixed rate for each degree program. The program amount is based on the rate per credit. The cost of textbooks and study materials are not included in the tuition and are outlined below.

Application Fee	\$35.00	(Non Refundable)
IT Service Fee	\$30.00	per semester
Library Fee	\$20.00	per semester
Textbooks	The student is responsible for securing all required textbooks unless otherwise stated	
Boot Camp weeks	The student is responsible for any travel, meals, and accommodation expenses that are incurred by attending boot camps.	

Auditing a course prior to completion for credit      \$1,100.00

If a student wants to audit a course that they need to complete for credit at a later time, the flat rate for access is \$1,100.00 and the student has access to lectures and homework assignments only.

Students in the following programs are expected to maintain student memberships with the following organizations:

**BS Medical Dosimetry Program**

American Association of Medical Dosimetrists      \$60.00 per year (directly to AAMD)

**FINANCIAL POLICIES**

The primary responsibility for financing a college education rests with the student. Students with unpaid balances may lose current enrollment and will not be allowed to register for any subsequent terms. Transcripts and diplomas are withheld from those who have not settled their financial obligations, which may include collection fees, attorney's fees, and court costs. Students are not fully registered, nor will they have the privilege of class attendance, participation in activities, or use of facilities until their charges are paid. A service charge of 1.5 percent, not to exceed \$45.00, may be added to any balance in the student account that is more than two (2) weeks past due.

Radiological Technologies University VT is not a participant in Federal or State financial aid programs.

**Payment**

Students assume the responsibility for payment of the tuition costs in full, either through direct payment or through a financial assistance plan for those who qualify. All financial arrangements must be made before the beginning of classes. The school will contact students who are delinquent in paying tuition and fees. They will then be counseled and encouraged to make specific arrangements with the school in order to remove their delinquency and remain in good financial standing. The school reserves the right to change tuition and fees, make curricular changes when necessary, and make substitutions in books and supplies as required without prior notice. Any changes in tuition or fees will not affect a student already in attendance or enrolled.

**Tuition Payment Methods**

Radiological Technologies University accepts payment for tuition, course materials, equipment and other fees through cash payment, all major credit/debit cards, cashier's check, personal check, or company check. Upon availability, Radiological Technologies University will also assist students in applying for student financial assistance in order to defray the cost of their education. At the school's discretion, a payment plan may be arranged for those who qualify. Radiological Technologies University does not participate in government student aid programs. All outstanding student account balances are billed directly to the student upon graduation or termination. Failure to satisfy delinquent accounts within a reasonable time period will result in the account being submitted to a collection agency for processing and the student will not be allowed to graduate.

Payment Plans: Students are able to qualify for payment plans directly with RTU when the student is unable to qualify for student loans, or they qualify for student loans at an interest rate above 7%. Monthly payment amounts for payment plans are expected to be manageable for the student and allow for the shortest duration of payments to satisfy the financial obligation of their program. The

minimum monthly payment amount is set at \$500, but some students may qualify for a lower monthly payment due to financial hardship.

### **Refunds**

The University shall pay a refund to the student in the amount calculated under the refund policy specified in this section. The University must make the proper refund no later than thirty-one (31) days of the student's request for cancellation or withdrawal.

The following refund policy applies:

- 1) A student is entitled to a full refund if one (1) or more of the following criteria are met:
  - A. The student cancels the enrollment agreement or enrollment application within six (6) business days after signing.
  - B. The student does not meet the postsecondary proprietary educational institution's minimum admission requirements.
  - C. The student's enrollment was procured as a result of a misrepresentation in the written materials utilized by the postsecondary proprietary educational institution.
  - D. If the student has not visited the postsecondary educational institution prior to enrollment and, upon touring the institution or attending the regularly scheduled orientation/classes, the student withdrew from the program within three (3) days.
- 2) A student withdrawing from an instructional program, after starting the instructional program at a postsecondary proprietary institution and attending one (1) week or less, is entitled to a refund of ninety percent (90%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 3) A student withdrawing from an instructional program, after attending more than one (1) week but equal to or less than twenty-five percent (25%) of the duration of the instructional program, is entitled to a refund of seventy-five percent (75%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 4) A student withdrawing from an instructional program, after attending more than twenty-five percent (25%) but equal to or less than fifty percent (50%) of the duration of the instructional program, is entitled to a refund of fifty percent (50%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 5) A student withdrawing from an instructional program, after attending more than fifty percent (50%) but equal to or less than sixty percent (60%) of the duration of the instructional program, is entitled to a refund of forty percent (40%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 6) A student withdrawing from an institutional program, after attending more than sixty percent (60%) of the duration of the instructional program, is not entitled to a refund.

**Federal VA Policy:****Title 38 US Code CFR 21.4255 Refund Policy; Non-Accredited Courses for IHL/NCD**

A refund of the unused portion of the tuition, fees and other charges will be made to the veteran or eligible person who fails to enter or fails to complete the course as required by Veteran Administration regulation. The refund will be within 10% (percent) of an exact pro rata refund. No more than \$10.00 of the established registration fee will be retained if a veteran or eligible person fails to enter and complete the course.

The code states that the exact proration will be determined on the ratio of the number of days of instruction completed by the student to the total number of instructional days in the course.

This policy will change upon accreditation of the school by an accrediting body recognized by the U.S Department of Education. The State Approving Agency will be notified accordingly.

**STUDENT SERVICES**

Faculty and staff work along with the individual student (as much as possible) to aid in making the duration of the program comfortable. All resources that are available to us are utilized to the fullest to assist the student in attaining his/her career goal.

**Placement Services**

RTU is actively engaged with assisting students and graduates in finding employment. Both the RTU faculty and administrative staff engage with the students during boot camp weeks to prepare them for employment opportunities. One-on-one sessions help identify the student's interest for placement. The faculty is well-connected and able to assist the student with developing relationships. RTU does not guarantee employment after graduation.

**Orientation**

A new student will receive online orientation including computer hardware and software requirements, resources available for successful completion of program requirements, as well as policies and procedures prior to the start of a program. Completion of administrative matters are also taken care of at this time. Each student will receive a written course outline no later than the first day of class.

**Books and Supplies**

Course material and resources will be provided to the students online. Required textbooks are to be obtained by the student. Students will be informed of what materials are required and where they may purchase them.

**Hours of Operation**

Administrative Offices

Monday – Friday

9:00 am – 5:00pm EST

**Contact Information**

100 E. Wayne Street, Suite 140

South Bend, IN 46601

Phone: 574.232.2408

Toll Free 877.411.7238

Fax: 574.232.2200

## PROGRAM DESCRIPTIONS

### Course Numbering System Descriptions

MP	Medical Physics
MHP	Medical Health Physics
MD	Medical Dosimetry
MI	Medical Imaging
NM	Medical Imaging: Nuclear Medicine/Positron Emission Tomography
MR	Medical Imaging: Magnetic Resonance Imaging
CT	Medical Imaging: Computed Tomography
US	Medical Imaging: Ultrasound
RTT	Radiation Therapy
BIOL	Biology courses
PHY	Physics courses
MATH	Mathematics
100-299	Associate level
300-499	Bachelor level
500-699	Graduate level

## UNDERGRADUATE LEVEL PROGRAMS

### Bachelor of Science in Medical Dosimetry

The Bachelor of Science in Medical Dosimetry program is designed to prepare students for the technical and theoretical aspects of a career in this field. Students acquire the professional skills of dose calculation, treatment design, and quality assurance through intensive classroom and clinical education under the supervision of educated and experienced Medical Dosimetrists, Physicists, and Radiation Oncologists.

The clinical education component of the program includes experience at other clinical affiliates. A well-balanced clinical experience is planned for each student, including daily and weekly quality assurance checks, two-dimensional external-beam treatment and brachytherapy planning, three-dimensional external-beam treatment planning, and intensity modulated radiation therapy treatment.

### Mission Statement

The program will prepare clinically competent, patient focused, entry-level medical dosimetrists who are able to make a positive contribution to the healthcare community.

Goal: Students will be clinically prepared and competent.

#### *Student Learning Outcomes:*

- ✓ Students will create multiple treatment plans in both simulated and actual clinical settings.
- ✓ Students will take an active role in their clinical rotation.

Goal: Students will develop critical thinking and problem solving skills.

#### *Student Learning Outcomes:*

- ✓ Students will discuss and evaluate various case studies related to the field.
  - ✓ Students will practice quality assurance by detecting and correcting plan errors.
- Goal: Students will demonstrate communication skills.
- Student Learning Outcomes:*
- ✓ Students will engage in oral presentations.
  - ✓ Students will demonstrate clear and concise written communication skills.
- Goal: Students will be team oriented and exemplify professional behavior.
- Student Learning Outcomes:*
- ✓ Students will demonstrate the ability to work and communicate in a group setting.
  - ✓ Students will model professional and courteous behavior with faculty, staff, and peers.
- Goal: Students will demonstrate professional planning practices
- Student Learning Outcomes:*
- ✓ Students will demonstrate knowledge of common toxicities by body site.
  - ✓ Students will demonstrate a clear understanding of the effects of radiation on the human body.
  - ✓ Students will evaluate plan parameters to ensure optimal patient care.

### **Program Application Requirements**

- ✓ Letters of reference
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

### **Program Admission Requirements**

- ✓ Associates degree in a science related field
  - 24 Core credits will be accepted for transfer
  - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of the categories below:
    - Humanities
    - Social Sciences
    - Sciences
    - Mathematics
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference
- ✓ The student must either pass the MATH190 Placement Test or complete the MATH190 course

## **MATH190 Placement Test**

### *Procedure*

Define a proctor (typically a local library or University proctor services) and provide the fax or email information to RTU at [info@rtuvt.edu](mailto:info@rtuvt.edu). The correspondence needs to include the day and time you plan to take the test. The test and proctor sheet will be provided to the proctor. Once the test is complete, the proctor will email or fax the test and proctor sheet to RTU.

Email: [info@rtuvt.edu](mailto:info@rtuvt.edu)

Fax: 574.232.2200

### *Test Instructions*

The student has 2 hours to complete the test. The student may utilize any resources they like and a calculator. The student must show all of their work. Answers without work will be considered incomplete.

The test includes four sections. Sections and points possible per section are outlined below. In order to pass the placement test, the student must earn a minimum of 75% on each section as well as 80% for an overall test score.

#### Sections:

1. Geometry and Trigonometry: Questions 1-4 (30 points possible)
2. Linear and Quadratic Functions: Questions 5-8 (30 points possible)
3. Exponential and Logarithmic Functions: Questions 9-10 (30 points possible)
4. Scientific Notation and the Metric System: Question 11 (10 points possible)

### **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 2.0 or above on a 4.0 scale
- ✓ Earn a minimum of 61 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of "Pass"

### **Clinical Obligations**

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

**Program Objectives:**

- ✓ Prepare clinically competent graduates
- ✓ Demonstrate communication skills
- ✓ Develop critical thinking skills
- ✓ Model professionalism

**Certification**

Graduates are not required to attain licensure as a Medical Dosimetrist. Graduates will be eligible to take the certification examination through the Medical Dosimetry Certification Board (MDCB) once Radiological Technologies University is approved by the Joint Review Committee on Education in Radiologic Technology (JRCERT). The Bachelor of Science in Medical Dosimetry program was designed to meet competency requirements outlined by JRCERT.

Radiological Technologies University’s BS Medical Dosimetry and MS Medical Dosimetry programs are accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT). All students are encouraged to review the JRCERT Standards for an accredited education program in Medical Dosimetry located at [www.jrcert.org/programs-faculty/jrcert-standards/](http://www.jrcert.org/programs-faculty/jrcert-standards/).

**JRCERT**

20 N. Wacker Drive, Suite 2850

Chicago, IL 60606-3182

Phone: (312) 704-5300

Fax: (312) 704-5304

[www.jrcert.org](http://www.jrcert.org)

[mail@jrcert.org](mailto:mail@jrcert.org)

**Program Details**

Required Credit hours: 121

Program Duration: Two years

Program Tuition: 25,417 (\$416.67 per credit for undergraduate level courses)

**Curriculum**

Core Courses (61/121\* credits required)

Transfer	General Education Credits*	(36 credits)
Transfer	Core Credits*	(24 credits)
MD301	Radiation Dosimetry	(3 credits)
MD303	Introduction to Imaging	(3 credits)
MD302	Radiation Biology	(3 credits)
MD305	Radiation Therapy I	(3 credits)
MD306	Radiation Therapy II	(3 credits)

MHP308	Health Physics & Radiation Safety	(3 credits)
MD304	Brachytherapy	(3 credits)
MD390	Medical & Professional Ethics	(1 credit)
BIOL301	Human Anatomy & Physiology	(4 credits)
MD310	Treatment Planning I	(3 credits)
MD311	Treatment Planning II	(3 credits)
MD410	Treatment Planning III	(3 credits)
MD411	Treatment Planning IV	(3 credits)
MD320	Clinical Rotation I	(4 credits)
MD321	Clinical Rotation II	(4 credits)
MD420	Clinical Rotation III	(4 credits)
MD421	Clinical Rotation IV	(4 credits)
MD499	Clinical Internship	(4 credits)

Elective Courses (1 course required)

MD351	Introduction to Medical Physics	(3 credits)
MD352	Imaging Anatomy	(3 credits)
MATH201	Calculus I	(3 credits)
MD205	Introduction to Radiation Therapy Planning <sup>A</sup>	(3 credits)
MD403	Advanced Imaging	(3 credits)
MD405	Alternative Modalities-Proton Therapy	(3 credits)

<sup>A</sup>Mandatory course for students entering the program without a Radiation Therapy background

**Sample Plan of Study**

Fall Semester	
Treatment Planning I	3
Clinical Rotation I	4
Elective	3
Radiation Biology	3
Human Anatomy & Physiology	4
	17cr

Spring Semester	
Treatment Planning II	3
Clinical Rotation II	4
Radiation Therapy I	3
Introduction to Imaging	3
Health Physics/Radiation Safety	3
	16cr

Summer Semester	
Treatment Planning III	3
Clinical Rotation III	4
Radiation Therapy II	3
Brachytherapy	3
Radiation Dosimetry	3
	16cr

Fall Semester	
Treatment Planning IV	3
Clinical Rotation IV	4
Medical and Professional Ethics	1
Clinical Internship	4
	12cr

## **Bachelor of Science in Radiation Therapy**

### *Non-Licensed Radiation Therapists*

The radiation therapy education program is designed to prepare students for the technical and theoretical aspects of a career in this field. Students acquire the professional skills of dose calculation, treatment delivery, and quality assurance through intensive classroom and clinical education under the supervision of educated, experienced, and credentialed Radiation Therapists, Medical Dosimetrists, Physicists, and Radiation Oncologists.

The clinical education component of the program includes experience at clinical affiliates. Clinical rotations are administered during each year of academic instruction. A well-balanced clinical experience is planned for each student, including interacting with patients and delivering radiation therapy using linear accelerators and brachytherapy. Students will also practice planning treatment using two-dimensional external-beam treatment and brachytherapy planning, three-dimensional external-beam treatment planning, and intensity modulated radiation therapy.

### Clinical Obligations

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

### Certification

Graduates are expected to attain licensure as a registered radiation therapist demonstrated through successful completion of the American Registry of Radiologic Technologists (ARRT) examination in radiation therapy. Graduates are eligible to take the ARRT examination in Radiation Therapy since ACICS is recognized by the ARRT. The Radiation Therapy program was designed to meet competency requirements outlined by the ARRT.

### *Licensed Radiation Therapists*

The radiation therapy education program is designed to prepare current therapists to expand their knowledge in the technical and theoretical aspects of their chosen career. Students acquire the

professional skills of dose calculation, treatment delivery, and quality assurance through an intensive curriculum developed and delivered by educated, experienced, and credentialed Radiation Therapists, Medical Dosimetrists, Physicists, and Radiation Oncologists.

Upon successful completion of the BS Radiation Therapy program:

- ✓ Students will provide clinically competent care to patients
- ✓ Students will demonstrate critical thinking and problem solving skills
- ✓ Students will display effective communication skills
- ✓ Students will demonstrate professional work standards
- ✓ The program will meet the needs of its students and the healthcare organizations it serves

**Program Objectives:**

- ✓ Prepare clinically competent graduates
- ✓ Demonstrate communication skills
- ✓ Develop critical thinking skills
- ✓ Model professionalism

**Program Application Requirements**

- ✓ Letters of reference
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

**Program Admission Requirements**

- ✓ Associates degree in a science related field or college credits and certification
  - Associates degree in a science related field
    - 24 Core credits will be accepted for transfer
    - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of these categories: Humanities, Social Sciences, Sciences, and Mathematics
  - College credits and certification
    - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of these categories: Humanities, Social Sciences, Sciences, and Mathematics
    - Holds a current license in the radiological sciences from The American Registry of Radiologic Technologists (ARRT) in Radiation Therapy.
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ The student must pass the MATH190 Placement Test or complete the MATH190 course
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference

## **MATH190 Placement Test**

### *Procedure*

Define a proctor (typically a local library or University proctor services) and provide the fax or email information to RTU at [info@rtuvt.edu](mailto:info@rtuvt.edu). The correspondence needs to include the day and time you plan to take the test. The test and proctor sheet will be provided to the proctor. Once the test is complete, the proctor will email or fax the test and proctor sheet to RTU.

Email: [info@rtuvt.edu](mailto:info@rtuvt.edu)

Fax: 574.232.2200

### *Test Instructions*

The student has 2 hours to complete the test. The student may utilize any resources they like and a calculator. The student must show all of their work. Answers without work will be considered incomplete.

The test includes four sections. Sections and points possible per section are outlined below. In order to pass the placement test, the student must earn a minimum of 75% on each section as well as 80% for an overall test score.

### Sections:

5. Geometry and Trigonometry: Questions 1-4 (30 points possible)
6. Linear and Quadratic Functions: Questions 5-8 (30 points possible)
7. Exponential and Logarithmic Functions: Questions 9-10 (30 points possible)
8. Scientific Notation and the Metric System: Question 11 (10 points possible)

## **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 2.0 or above on a 4.0 scale
- ✓ Earn a minimum of 64 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of "Pass"

## **Clinical Obligations**

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical

internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

### **Program Details**

Required Credit hours: 124

Program Duration: Two years (5 semesters)

Program Tuition: \$26,667 (\$416.67 per credit undergraduate level courses)

### **Curriculum**

Core Courses (64/124\* credits required)

#### *All Students*

Transfer	General Education Credits*	(36 credits)
Transfer	Core Credits*	(24 credits)
RTT100	Orientation for Radiological Sciences	(2 credits)
BIOL352	Imaging and Sectional Anatomy	(4 credits)
RTT301	Clinical Oncology I	(3 credits)
RTT303	Radiation Therapy Technical I	(3 credits)
RTT302	Radiation Biology	(3 credits)
RTT305	Radiation Therapy I	(3 credits)
RTT306	Principles/Practices of Radiation Therapy	(3 credits)
RTT311	Clinical Oncology II	(3 credits)
SCI390	Medical and Professional Ethics/Patient Care	(1 credit)
RTT315	Physics of Radiation Therapy II	(3 credits)
RTT410	Dosimetry/Treatment Planning I	(3 credits)
RTT412	Dosimetry/Treatment Planning II	(3 credits)
RTT414	QA & Radiation Safety	(3 credits)
BIOL301	Human Anatomy & Physiology	(4 credits)
RTT351	Introduction to Medical Physics	(1 credit)
SCI300	Introduction to Cancer Care and Nanomedicine	(2 credits)
RTT430	Radiation Therapy Department Management	(2 credits)

#### *Courses to be taken only by non-licensed Radiation Therapists*

RTT320	Clinical Rotation I	(4 credits)
RTT321	Clinical Rotation II	(3 credits)
RTT420	Clinical Rotation III	(4 credits)
RTT421	Clinical Rotation IV	(4 credits)
RTT490	Comprehensive/Exam Review	(3 credits)

#### *Courses to be taken only by licensed Radiation Therapists*

RTT400	Advanced Radiation Therapy Techniques	(3 credits)
RTT431	Advanced Patient Care in Oncologic Medicine	(3 credits)
MI330	Leadership and Communication	(3 credits)
RTT435	Research Methods	(3 credits)
RTT436	Directed Research in Radiation Therapy	(4 credits)
RTT440	Clinical Quality Improvement and Accreditation	(2 credits)

### Sample Plan of Study for Licensed Radiation Therapists

Fall	
Orientation for Radiological Sciences	2
Human Anatomy & Physiology	4
Principles/Practices of Radiation Therapy	3
Clinical Oncology I	3
Radiation Therapy Technical I	3
	15cr

Spring	
Medical and Professional Ethics/Patient Care	1
Imaging and Sectional Anatomy	4
Leadership and Communication	3
Clinical Oncology II	3
Clinical Quality Improvement and Accreditation	2
	12cr

Summer	
Radiation Therapy I	3
Dosimetry/Treatment Planning I	3
Adv. Patient Care in Oncologic Medicine	3
Radiation Biology	3
	12cr

Fall Year 2	
Physics of Radiation Therapy II	3
Dosimetry/Treatment Planning II	3
Research Methods	3
QA and Radiation Safety	3
	12cr

Spring Year 2	
Adv. Radiation Therapy Techniques	3
Radiation Therapy Dept. Mgmt.	2
Directed Research in Radiation Therapy	4
Intro to Medical Physics	1
Intro to Cancer Care and Nanomedicine	2
	12cr

### Sample Plan of Study for Non-Licensed Radiation Therapists

Fall	
Orientation for Radiological Sciences	2
Human Anatomy & Physiology	4
Principles/Practices of Radiation Therapy	3
Clinical Oncology I	3
Radiation Therapy Technical I	3
	15cr

Spring	
Medical and Professional Ethics/Patient Care	1
Imaging and Sectional Anatomy	4
Clinical Rotation I	4
Clinical Oncology II	3
	12cr

Summer	
Radiation Therapy I	3
Dosimetry/Treatment Planning I	3
Clinical Rotation II	3
Radiation Biology	3
	12cr

Fall Year 2	
Radiation Therapy II	3
Dosimetry/Treatment Planning II	3
Clinical Rotation III	4
QA and Radiation Safety	3
	13cr

Spring Year 2	
Comprehensive/Exam Review	3
Radiation Therapy Dept. Mgmt.	2
Clinical Rotation IV	4
Introduction to Medical Physics	1
Introduction to Cancer Care and Nanomedicine	2
	12cr

### **Bachelor of Science in Medical Imaging with Specialization in Computed Tomography**

The BS in Medical Imaging prepares students to practice competently and effectively as medical imaging professionals in diverse healthcare environments. The academic and clinical foundation in the curriculum develops graduates with professional flexibility and adaptability to assume prominent roles and responsibilities after graduation in both career and scholarly pursuits.

Upon successful completion of the CT specialization curriculum, the program's objectives include the following:

- ✓ Prepare graduates for employment as an entry level CT Technologist
- ✓ Prepare graduates to take the ARRT post-primary advanced certification examination in CT
- ✓ Prepare graduates to function as critical thinkers in their profession
- ✓ Provide medical imaging education that promotes excellence in the healthcare environment

Student Learning Outcomes:

- ✓ Obtain a level of clinical competence appropriate to an entry-level medical imaging professional
- ✓ Possess critical thinking skills to adapt to changing clinical environments and patient needs
- ✓ Exhibit professionalism through consistent ethical behavior
- ✓ Demonstrate communication skills for effective communication with patients, families, and other healthcare providers

The Medical Imaging program was designed to meet competency requirements outlined by the American Registry of Radiologic Technologists (ARRT).

### **Program Application Requirements**

- ✓ Program application
- ✓ Letters of recommendation
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

### **Program Admission Requirements**

- ✓ Associate's Degree in a science related field
  - 24 Core credits will be accepted for transfer
  - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of the categories below:
    - Humanities
    - Social Sciences
    - Sciences
    - Mathematics
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference
- ✓ The student must either pass the MATH190 Placement Test or complete the MATH190 course
- ✓ Prerequisites: Human Anatomy & Physiology

### **MATH190 Placement Test**

#### *Procedure*

Define a proctor (typically a local library or University proctor services) and provide the fax or email information to RTU at [info@rtuvt.edu](mailto:info@rtuvt.edu). The correspondence needs to include the day and time you plan to take the test. The test and proctor sheet will be provided to the proctor. Once the test is complete, the proctor will email or fax the test and proctor sheet to RTU.

Email: [info@rtuvt.edu](mailto:info@rtuvt.edu)

Fax: 574.232.2200

#### *Test Instructions*

The student has 2 hours to complete the test. The student may utilize any resources they like and a calculator. The student must show all of their work. Answers without work will be considered incomplete.

The test includes four sections. Sections and points possible per section are outlined below. In order to pass the placement test, the student must earn a minimum of 75% on each section as well as 80% for an overall test score.

Sections:

1. Geometry and Trigonometry: Questions 1-4 (30 points possible)
2. Linear and Quadratic Functions: Questions 5-8 (30 points possible)
3. Exponential and Logarithmic Functions: Questions 9-10 (30 points possible)
4. Scientific Notation and the Metric System: Question 11 (10 points possible)

### **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 2.0 or above on a 4.0 scale
- ✓ Earn a minimum of 60 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of "Pass"

### **Clinical Obligations**

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

### **Certification**

The American Registry of Radiologic Technologists (ARRT) certifies CT Technologists. Certification is not required for graduates to work in CT. Students are eligible to take the ARRT post-primary examination in CT upon completion of the program since RTU's national accrediting body, the Accrediting Council for Independent Colleges and Schools (ACICS) is recognized by the ARRT.

### **Program Details**

Required Credit hours: 60/120\*

Program Duration: Two years (4 semesters)

Program Tuition: 25,000 (12,500) per year (\$416.67 per credit undergraduate level courses)

## Curriculum

### Core Courses

Transfer	General Education Credits*	(36 credits)
Transfer	Core Credits*	(24 credits)
MI301	Introduction to Nuclear Medicine/PET	(3 credits)
MI303	Introduction to CT/MRI	(3 credits)
MI307	Introduction to Ultrasound	(3 credits)
MHP308	Health Physics/Radiation Safety	(3 credits)
MI309	Clinical Management	(3 credits)
MI310	Pathology and Disease	(3 credits)
MI330	Leadership and Communication	(3 credits)
MD301	Radiation Dosimetry	(3 credits)
MD351	Introduction to Medical Physics	(3 credits)
MD390	Medical and Professional Ethics	(1 credit)
CT390	Clinical I – CT	(6 credits)
CT391	Clinical II – CT	(6 credits)
CT490	Clinical III – CT	(6 credits)
CT491	Clinical IV – CT	(6 Credits)
CT401	Advanced Techniques I – CT	(3 credits)
CT403	Advanced Techniques II – CT	(3 credits)
CT410	Capstone Course – CT	(2 credits)

### Sample Plan of Study (spring semester start)

Spring	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - CT	6
	15cr

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II - CT	6
	13cr

Fall	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical III – CT	6
Advanced Techniques I - CT	3

Spring Year 2	
Leadership and Communication	3
Clinical Management	3
Clinical IV – CT	6
Advanced Techniques II –CT	3
Capstone Course - CT	2

	15cr
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	17cr
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**Sample Plan of Study (summer semester start)**

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical I - CT	6
	13cr

Fall	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical II - CT	6
	15cr

Spring	
Leadership and Communication	3
Clinical Management	3
Clinical III – CT	6
Advanced Techniques I – CT	3
Capstone Course - CT	2
	17cr

Summer Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – CT	6
Advanced Techniques II - CT	3
	15cr

**Sample Plan of Study (fall semester start)**

Fall	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - CT	6
	15cr

Spring	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II - CT	6
	13cr

Summer	
Leadership and Communication	3
Clinical Management	3
Clinical III – CT	6
Advanced Techniques I – CT	3
Capstone Course - CT	2
	17cr

Fall Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – CT	6
Advanced Techniques II - CT	3
	15cr

## **Bachelor of Science in Medical Imaging with Specialization in Magnetic Resonance Imaging**

The BS in Medical Imaging prepares students to practice competently and effectively as medical imaging professionals in diverse healthcare environments. The academic and clinical foundation in the curriculum develops graduates with professional flexibility and adaptability to assume prominent roles and responsibilities after graduation in both career and scholarly pursuits.

Upon successful completion of the MRI specialization curriculum, the program's objectives include the following:

- ✓ Prepare graduates for employment as an entry level MRI Technologist
- ✓ Prepare graduates to take the ARRT certification examination in MRI
- ✓ Prepare graduates to function as critical thinkers in their profession
- ✓ Provide medical imaging education that promotes excellence in the healthcare environment

Student Learning Outcomes:

- ✓ Obtain a level of clinical competence appropriate to an entry-level medical imaging professional
- ✓ Possess critical thinking skills to adapt to changing clinical environments and patient needs
- ✓ Exhibit professionalism through consistent ethical behavior
- ✓ Demonstrate communication skills for effective communication with patients, families, and other healthcare providers

The Medical Imaging program was designed to meet competency requirements outlined by the American Registry of Radiologic Technologists (ARRT).

### **Program Application Requirements**

- ✓ Program application
- ✓ Letters of recommendation
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

### **Program Admission Requirements**

- ✓ Associate's Degree in a science related field
  - 24 Core credits will be accepted for transfer
  - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of the categories below:
    - Humanities
    - Social Sciences
    - Sciences
    - Mathematics
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79

(internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5

- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference
- ✓ The student must either pass the MATH190 Placement Test or complete the MATH190 course
- ✓ Prerequisites: Human Anatomy & Physiology

## **MATH190 Placement Test**

### *Procedure*

Define a proctor (typically a local library or University proctor services) and provide the fax or email information to RTU at [info@rtuvt.edu](mailto:info@rtuvt.edu). The correspondence needs to include the day and time you plan to take the test. The test and proctor sheet will be provided to the proctor. Once the test is complete, the proctor will email or fax the test and proctor sheet to RTU.

Email: [info@rtuvt.edu](mailto:info@rtuvt.edu)

Fax: 574.232.2200

### *Test Instructions*

The student has 2 hours to complete the test. The student may utilize any resources they like and a calculator. The student must show all of their work. Answers without work will be considered incomplete.

The test includes four sections. Sections and points possible per section are outlined below. In order to pass the placement test, the student must earn a minimum of 75% on each section as well as 80% for an overall test score.

### Sections:

1. Geometry and Trigonometry: Questions 1-4 (30 points possible)
2. Linear and Quadratic Functions: Questions 5-8 (30 points possible)
3. Exponential and Logarithmic Functions: Questions 9-10 (30 points possible)
4. Scientific Notation and the Metric System: Question 11 (10 points possible)

## **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 2.0 or above on a 4.0 scale
- ✓ Earn a minimum of 60 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of "Pass"

## **Clinical Obligations**

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

### **Certification**

The American Registry of Radiologic Technologists (ARRT) certifies MRI Technologists. Certification is not required for graduates to work in the specialty of MRI if they are already certified Radiologic Technologists. Graduates are eligible to take the ARRT examination in MRI upon completion of the program since RTU's national accrediting body, the Accrediting Council for Independent Colleges and Schools (ACICS) is recognized by the ARRT.

### **Program Details**

Required Credit hours: 60/120\*

Program Duration: Two years (4 semesters)

Program Tuition: 25,000 (12,500) per year (\$416.67 per credit undergraduate level courses)

### **Curriculum**

#### Core Courses

Transfer	General Education Credits*	(36 credits)
Transfer	Core Credits*	(24 credits)
MI301	Introduction to Nuclear Medicine/PET	(3 credits)
MI303	Introduction to CT/MRI	(3 credits)
MI307	Introduction to Ultrasound	(3 credits)
MHP308	Health Physics/Radiation Safety	(3 credits)
MI309	Clinical Management	(3 credits)
MI310	Pathology and Disease	(3 credits)
MI330	Leadership and Communication	(3 credits)
MD301	Radiation Dosimetry	(3 credits)
MD351	Introduction to Medical Physics	(3 credits)
MD390	Medical and Professional Ethics	(1 credit)
MR390	Clinical I – MRI	(6 credits)
MR391	Clinical II – MRI	(6 credits)
MR490	Clinical III – MRI	(6 credits)
MR491	Clinical IV – MRI	(6 Credits)

MR401	Advanced Techniques I – MRI	(3 credits)
MR403	Advanced Techniques II – MRI	(3 credits)
MR410	Capstone Course – MRI	(2 credits)

**Sample Plan of Study (spring semester start)**

Spring	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - MRI	6
	15cr

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II - MRI	6
	13cr

Fall	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical III – MRI	6
Advanced Techniques I - MRI	3
	15cr

Spring Year 2	
Leadership and Communication	3
Clinical Management	3
Clinical IV – MRI	6
Advanced Techniques II – MRI	3
Capstone Course - MRI	2
	17cr

**Sample Plan of Study (summer semester start)**

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical I - MRI	6
	13cr

Fall	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical II - MRI	6
	15cr

Spring	
Leadership and Communication	3
Clinical Management	3
Clinical III – MRI	6
Advanced Techniques I – MRI	3
Capstone Course - MRI	2
	17cr

Summer Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – MRI	6
Advanced Techniques II - MRI	3
	15cr

### Sample Plan of Study (fall semester start)

Fall	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - MRI	6
	15cr

Spring	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II - MRI	6
	13cr

Summer	
Leadership and Communication	3
Clinical Management	3
Clinical III – MRI	6
Advanced Techniques I – MRI	3
Capstone Course - MRI	2
	17cr

Fall Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – MRI	6
Advanced Techniques II - MRI	3
	15cr

### Bachelor of Science in Medical Imaging with Specialization in Ultrasound

The BS in Medical Imaging prepares students to practice competently and effectively as medical imaging professionals in diverse healthcare environments. The academic and clinical foundation in the curriculum develops graduates with professional flexibility and adaptability to assume prominent roles and responsibilities after graduation in both career and scholarly pursuits.

Upon successful completion of the Ultrasound specialization curriculum, the program’s objectives include the following:

- ✓ Prepare graduates for employment as an entry level Ultrasound Technologist
- ✓ Prepare graduates to take the ARRT certification examination in Ultrasound
- ✓ Prepare graduates to function as critical thinkers in their profession
- ✓ Provide medical imaging education that promotes excellence in the healthcare environment

Student Learning Outcomes:

- ✓ Obtain a level of clinical competence appropriate to an entry-level medical imaging professional
- ✓ Possess critical thinking skills to adapt to changing clinical environments and patient needs
- ✓ Exhibit professionalism through consistent ethical behavior
- ✓ Demonstrate communication skills for effective communication with patients, families, and other healthcare providers

The Medical Imaging program was designed to meet competency requirements outlined by the American Registry of Radiologic Technologists (ARRT).

### Program Application Requirements

- ✓ Program application
- ✓ Letters of recommendation
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

### **Program Admission Requirements**

- ✓ Associate's Degree in a science related field
  - 24 Core credits will be accepted for transfer
  - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of the categories below:
    - Humanities
    - Social Sciences
    - Sciences
    - Mathematics
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference
- ✓ The student must either pass the MATH190 Placement Test or complete the MATH190 course
- ✓ Prerequisites: Human Anatomy & Physiology

### **MATH190 Placement Test**

#### *Procedure*

Define a proctor (typically a local library or University proctor services) and provide the fax or email information to RTU at [info@rtuvt.edu](mailto:info@rtuvt.edu). The correspondence needs to include the day and time you plan to take the test. The test and proctor sheet will be provided to the proctor. Once the test is complete, the proctor will email or fax the test and proctor sheet to RTU.

Email: [info@rtuvt.edu](mailto:info@rtuvt.edu)

Fax: 574.232.2200

#### *Test Instructions*

The student has 2 hours to complete the test. The student may utilize any resources they like and a calculator. The student must show all of their work. Answers without work will be considered incomplete.

The test includes four sections. Sections and points possible per section are outlined below. In order to pass the placement test, the student must earn a minimum of 75% on each section as well as 80% for an overall test score.

Sections:

1. Geometry and Trigonometry: Questions 1-4 (30 points possible)
2. Linear and Quadratic Functions: Questions 5-8 (30 points possible)
3. Exponential and Logarithmic Functions: Questions 9-10 (30 points possible)
4. Scientific Notation and the Metric System: Question 11 (10 points possible)

### **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 2.0 or above on a 4.0 scale
- ✓ Earn a minimum of 60 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of “Pass”

### **Clinical Obligations**

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

### **Certification**

The American Registry of Radiologic Technologists (ARRT) certifies Ultrasound Technologists. Certification is not required for graduates to work in the specialty of Ultrasound, but four states have proposed or passed licensure laws that require certification to obtain the license: Oregon, New Mexico, West Virginia, and New Jersey. Graduates are eligible to take the ARRT examination in Ultrasound upon completion of the program since RTU’s national accrediting body, the Accrediting Council for Independent Colleges and Schools (ACICS) is recognized by the ARRT.

## Program Details

Required Credit hours: 60/120\*

Program Duration: Two years (4 semesters)

Program Tuition: 25,000 (12,500) per year (\$416.67 per credit undergraduate level courses)

## Curriculum

### Core Courses

Transfer	General Education Credits*	(36 credits)
Transfer	Core Credits*	(24 credits)
MI301	Introduction to Nuclear Medicine/PET	(3 credits)
MI303	Introduction to CT/MRI	(3 credits)
MI307	Introduction to Ultrasound	(3 credits)
MHP308	Health Physics/Radiation Safety	(3 credits)
MI309	Clinical Management	(3 credits)
MI310	Pathology and Disease	(3 credits)
MI330	Leadership and Communication	(3 credits)
MD301	Radiation Dosimetry	(3 credits)
MD351	Introduction to Medical Physics	(3 credits)
MD390	Medical and Professional Ethics	(1 credit)
US390	Clinical I – US	(6 credits)
US391	Clinical II – US	(6 credits)
US490	Clinical III – US	(6 credits)
US491	Clinical IV – US	(6 Credits)
US401	Advanced Techniques I – US	(3 credits)
US403	Advanced Techniques II – US	(3 credits)
US410	Capstone Course – US	(2 credits)

### Sample Plan of Study (spring semester start)

Spring	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - US	6
	15cr

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II - US	6
	13cr

Fall	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical III – US	6
Advanced Techniques I - US	3
	15cr

Spring Year 2	
Leadership and Communication	3
Clinical Management	3
Clinical IV – US	6
Advanced Techniques II – US	3
Capstone Course - US	2
	17cr

### Sample Plan of Study (summer semester start)

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical I - US	6
	13cr

Fall	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical II - US	6
	15cr

Spring	
Leadership and Communication	3
Clinical Management	3
Clinical III – US	6
Advanced Techniques I – US	3
Capstone Course - US	2
	17cr

Summer Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – US	6
Advanced Techniques II - US	3
	15cr

**Sample Plan of Study (fall semester start)**

Fall	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - US	6
	15cr

Spring	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II – US	6
	13cr

Summer	
Leadership and Communication	3
Clinical Management	3
Clinical III – US	6
Advanced Techniques I – US	3
Capstone Course - US	2
	17cr

Fall Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – US	6
Advanced Techniques II - US	3
	15cr

**Bachelor of Science in Medical Imaging with Specialization in Nuclear Medicine/Positron Emission Tomography**

The BS in Medical Imaging prepares students to practice competently and effectively as medical imaging professionals in diverse healthcare environments. The academic and clinical foundation in the curriculum develops graduates with professional flexibility and adaptability to assume prominent roles and responsibilities after graduation in both career and scholarly pursuits.

Upon successful completion of the Nuclear Medicine/PET specialization curriculum, the program's objectives include the following:

- ✓ Prepare graduates for employment as an entry level Nuclear Medicine/PET Technologist
- ✓ Prepare graduates to take the ARRT certification examination in Nuclear Medicine
- ✓ Prepare graduates to function as critical thinkers in their profession
- ✓ Provide medical imaging education that promotes excellence in the healthcare environment

Student Learning Outcomes:

- ✓ Obtain a level of clinical competence appropriate to an entry-level medical imaging professional
- ✓ Possess critical thinking skills to adapt to changing clinical environments and patient needs
- ✓ Exhibit professionalism through consistent ethical behavior
- ✓ Demonstrate communication skills for effective communication with patients, families, and other healthcare providers

The Medical Imaging program was designed to meet competency requirements outlined by the American Registry of Radiologic Technologists (ARRT).

#### **Program Application Requirements**

- ✓ Program application
- ✓ Letters of recommendation
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

#### **Program Admission Requirements**

- ✓ Associate's Degree in a science related field
  - 24 Core credits will be accepted for transfer
  - 36 General Education credits will be accepted for transfer. There must be at least one general education course from each of the categories below:
    - Humanities
    - Social Sciences
    - Sciences
    - Mathematics
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference
- ✓ The student must either pass the MATH190 Placement Test or complete the MATH190 course
- ✓ Prerequisites: Human Anatomy & Physiology

## **MATH190 Placement Test**

### *Procedure*

Define a proctor (typically a local library or University proctor services) and provide the fax or email information to RTU at [info@rtuvt.edu](mailto:info@rtuvt.edu). The correspondence needs to include the day and time you plan to take the test. The test and proctor sheet will be provided to the proctor. Once the test is complete, the proctor will email or fax the test and proctor sheet to RTU.

Email: [info@rtuvt.edu](mailto:info@rtuvt.edu)

Fax: 574.232.2200

### *Test Instructions*

The student has 2 hours to complete the test. The student may utilize any resources they like and a calculator. The student must show all of their work. Answers without work will be considered incomplete.

The test includes four sections. Sections and points possible per section are outlined below. In order to pass the placement test, the student must earn a minimum of 75% on each section as well as 80% for an overall test score.

#### Sections:

1. Geometry and Trigonometry: Questions 1-4 (30 points possible)
2. Linear and Quadratic Functions: Questions 5-8 (30 points possible)
3. Exponential and Logarithmic Functions: Questions 9-10 (30 points possible)
4. Scientific Notation and the Metric System: Question 11 (10 points possible)

### **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 2.0 or above on a 4.0 scale
- ✓ Earn a minimum of 60 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of "Pass"

### **Clinical Obligations**

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical

internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

### **Certification**

The American Registry of Radiologic Technologists (ARRT) certifies Nuclear Medicine/PET Technologists. Certification is not required for graduates to work in the specialty of Nuclear Medicine if the graduate is licensed by the ARRT in general radiography. Graduates are eligible to take the ARRT examination in Nuclear Medicine upon completion of the program since RTU's national accrediting body, the Accrediting Council for Independent Colleges and Schools (ACICS) is recognized by the ARRT.

### **Program Details**

Required Credit hours: 60/120\*

Program Duration: Two years (4 semesters)

Program Tuition: 25,000 (12,500) per year (\$416.67 per credit undergraduate level courses)

### **Curriculum**

#### Core Courses

Transfer	General Education Credits*	(36 credits)
Transfer	Core Credits*	(24 credits)
MI301	Introduction to Nuclear Medicine/PET	(3 credits)
MI303	Introduction to CT/MRI	(3 credits)
MI307	Introduction to Ultrasound	(3 credits)
MHP308	Health Physics/Radiation Safety	(3 credits)
MI309	Clinical Management	(3 credits)
MI310	Pathology and Disease	(3 credits)
MI330	Leadership and Communication	(3 credits)
MD301	Radiation Dosimetry	(3 credits)
MD351	Introduction to Medical Physics	(3 credits)
MD390	Medical and Professional Ethics	(1 credit)
NM390	Clinical I – NM	(6 credits)
NM391	Clinical II – NM	(6 credits)
NM490	Clinical III – NM	(6 credits)
NM491	Clinical IV – NM	(6 Credits)
NM401	Advanced Techniques I – NM	(3 credits)
NM403	Advanced Techniques II – NM	(3 credits)
NM410	Capstone Course – NM	(2 credits)

### **Sample Plan of Study (spring semester start)**

Spring	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - NM	6
	15cr

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II - NM	6
	13cr

Fall	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical III – NM	6
Advanced Techniques I - NM	3
	15cr

Spring Year 2	
Leadership and Communication	3
Clinical Management	3
Clinical IV – NM	6
Advanced Techniques II – NM	3
Capstone Course - NM	2
	17cr

**Sample Plan of Study (summer semester start)**

Summer	
Introduction to CT/MRI	3
Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical I - NM	6
	13cr

Fall	
Health Physics/Radiation Safety	3
Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical II - NM	6
	15cr

Spring	
Leadership and Communication	3
Clinical Management	3
Clinical III – NM	6
Advanced Techniques I – NM	3
Capstone Course - NM	2
	17cr

Summer Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – NM	6
Advanced Techniques II - NM	3
	15cr

**Sample Plan of Study (fall semester start)**

Fall	
Health Physics/Radiation Safety	3

Spring	
Introduction to CT/MRI	3

Radiation Dosimetry	3
Introduction to Nuclear Medicine/PET	3
Clinical I - NM	6
	15cr

Introduction to Ultrasound	3
Medical and Professional Ethics	1
Clinical II - NM	6
	13cr

Summer	
Leadership and Communication	3
Clinical Management	3
Clinical III – NM	6
Advanced Techniques I – NM	3
Capstone Course - NM	2
	17cr

Fall Year 2	
Introduction to Medical Physics	3
Pathology and Disease	3
Clinical IV – NM	6
Advanced Techniques II - NM	3
	15cr

## UNIVERSITY STRUCTURE

Radiological Technologies University  
100 E. Wayne Street, Suite 140  
South Bend, IN 46601  
Phone: 574-232-2408  
Fax: 574-232-2200  
Website: [www.rtuvt.edu](http://www.rtuvt.edu)

### Board of Directors

Brent D. Murphy, MS, MBA, DABR	Founder and Chairman, President
Renat Letfullin, Ph.D.	Member
Scott Dube, MS, DABR	Member
Andy Downing	Member
Greg Hiatt, RpH	Member

### Advisory Board: Medical Physics, Medical Health Physics, Nanomedicine

Brent D. Murphy, MS, MBA, DABR	Founder and Chairman, President
Renat Letfullin, Ph.D.	Member
Scott Dube, MS, DABR	Member
Manuel Arreola, Ph.D., DABR	Member
Steve Goetsch, Ph.D., DABMP	Member

### Advisory Board: Medical Dosimetry, Radiation Therapy

Brent D. Murphy, MS, MBA, DABR	Founder and Chairman, President
Scott Dube, MS, DABR	Member
Mellonie Brown-Zacarias, M.E.T., CMD, R.T.(T.)	Member
Carol Scherbak, M.S.R.S., R.T.(T.)	Member

### Program Leadership

Scott Dube, MS, DABR	Medical Physics Program Director
Manuel Arreola, Ph.D., DABR	Medical Physics Imaging Program Director
Renat Letfullin, Ph.D.	Nanomedicine Program Director
Mellonie Brown, M.E.T., CMD, R.T.(T.)	Medical Dosimetry Program Director
	Radiation Therapy Program Director
	Medical Imaging Program Director

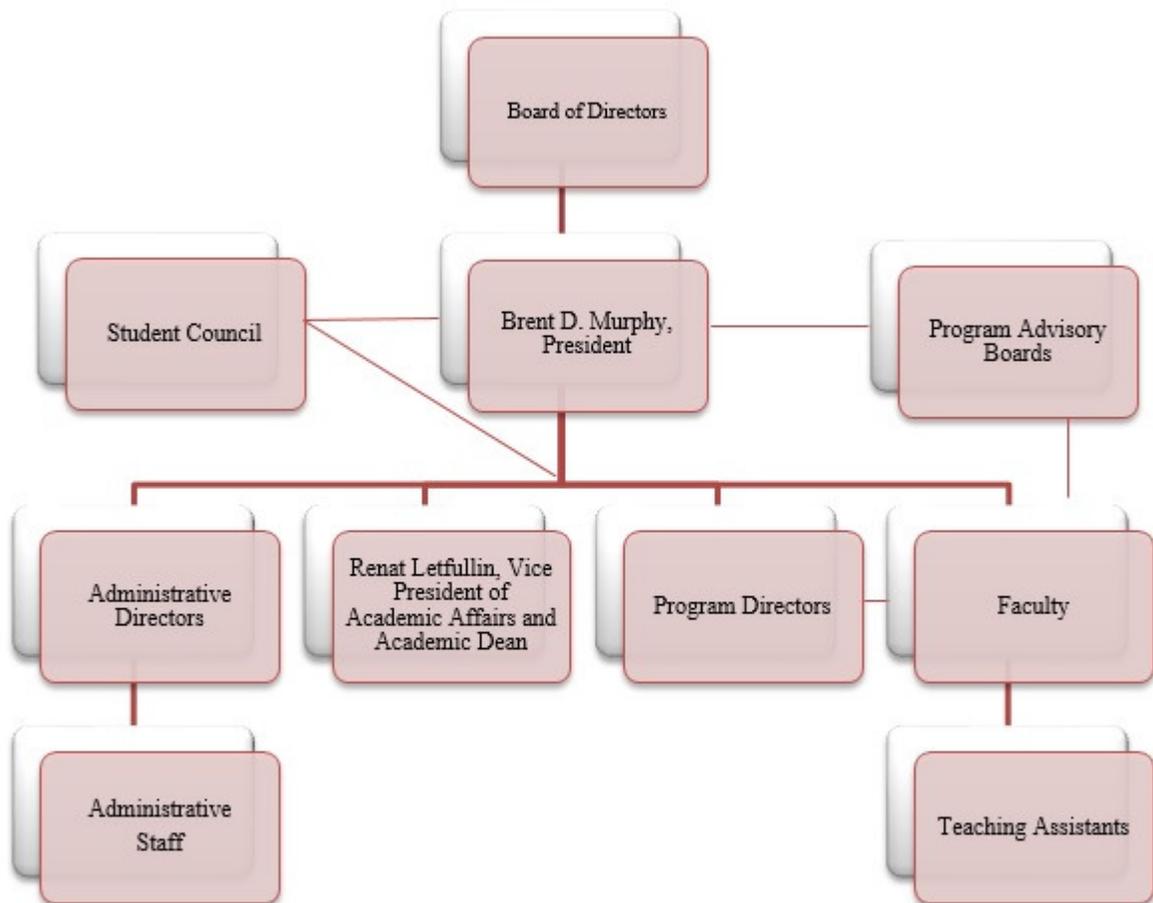
### Administrative Control

Brent D. Murphy, MS, DABR	President
Renat Letfullin Ph.D.	Vice President of Academic Affairs and Academic Dean
Elizabeth Datema, BS	Director of Administrative Services

### Staff Listing

Brent Murphy, MS, DABR	President
Elizabeth Datema, BS	Director of Administrative Services
Linda Murphy, BS	Director of Recruitment
Kuralay Kussainova, MS	Recruiter, Marketing Assistant, International Relations
Barbara Wallace, MLS	Librarian
Debra Merley	Administrative Assistant

# Radiological Technologies University Organizational Chart



# RTU-VT COURSE CATALOG

## PROGRAM DESCRIPTIONS

### Course numbering system descriptions

MHP	Medical Health Physics
MD	Medical Dosimetry
MI	Medical Imaging
NM	Medical Imaging: Nuclear Medicine/Positron Emission Tomography
MR	Medical Imaging: Magnetic Resonance Imaging
CT	Medical Imaging: Computed Tomography
US	Medical Imaging: Ultrasound
RTT	Radiation Therapy
BIOL	Biology courses
PHY	Physics courses
MATH	Mathematics
SCI	Sciences

100-299 Associate level

300-499 Bachelor level

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### Credit hour definition

One semester credit hour equals, at a minimum, 15 classroom hours of lecture and 30 hours of laboratory or 45 hours of practicum. The formula for calculating the number of semester credit hours for each course is:  $(\text{hours of lecture}/15) + (\text{hours of lab}/30) + (\text{hours of practicum}/45)$ .

## UNDERGRADUATE COURSES DESCRIPTIONS

MD301

RADIATION DOSIMETRY

3 CREDITS

This course focuses on introducing radiation terminology used in radiation dosimetry. Fundamental dose calculation theories are reviewed and an emphasis is placed on clinical and radiation safety related dosimetry techniques.

MD302/RTT302

RADIATION BIOLOGY

3 CREDITS

This course focuses on introducing fundamental radiation biology concepts. Emphasis is placed on radiation interactions, cell damage, cell survival curves, cell sensitivity and response, factors affecting cell response, tissue kinetics, effects on the fetus, biological models, and radiobiological risk assessment.

MD303

INTRODUCTION TO IMAGING

3 CREDITS

This course focuses on introducing fundamental physics in the medical imaging profession. Fundamental concepts are applied to the system design of each imaging component presented. A special emphasis is placed on the implementation and application of each diagnostic imaging modality.

MD304

**BRACHYTHERAPY**

**3 CREDITS**

This course focuses on introducing fundamental radiation physics and safety of brachytherapy. Special emphasis is placed on both LDR and HDR brachytherapy.

MD305 / RTT305

**RADIATION THERAPY I**

**3 CREDITS**

This course focuses on applying the fundamental radiation oncology physics concepts to external beam radiation therapy. An emphasis is placed on understanding basic dosimetry quantities, dose calculation parameters, dose calculations, monitor unit calculations, instrumentation, and radiation generating equipment.

MD306

**RADIATION THERAPY II**

**3 CREDITS**

This course builds upon the fundamental ideas developed in Radiation Therapy I. A wide range of specialized topics are covered. The intent is to familiarize the student with a broad swath of special procedures encountered in radiation oncology, and to provide in-depth understanding of the most common of these special procedures. The course also covers the process of machine acceptance and commissioning, the use of this data by the operator of the treatment planning system, and how the system then uses that data to calculate doses from therapy devices. Emphasis throughout this course is placed on quality control and quality assurance.

Prerequisite: Radiation Therapy I (MD305)

MD390

**MEDICAL AND PROFESSIONAL ETHICS**

**1 CREDIT**

This course focuses areas that require an understanding of medical ethics. Emphasis will be placed on patient data, patient records, publications, presentations, general professional conduct, medical malpractice, and research.

MHP308

**HEALTH PHYSICS AND RADIATION SAFETY**

**3 CREDITS**

This course focuses on introducing fundamental medical and health physics concepts for the Dosimetrist professional. Fundamental concepts of patient dosimetry, radiation effects in humans, and radiation protection are covered.

MD310

TREATMENT PLANNING I

3 CREDITS

This course focuses on the didactic component and clinical component of treatment planning preparation and isodose distribution. The concepts and factors affecting preparation and planning are reviewed and evaluated.

Prerequisite: one semester of Anatomy

MD311

TREATMENT PLANNING II

3 CREDITS

This course focuses on 3D treatment planning for the following body sites: Lung, prostate, breast, and head/neck. Emphasis is placed on patient positioning and immobilization, imaging, 3D geometry definition, treatment planning system functionality, treatment planning, dose verification, and terminology.

Prerequisite: Treatment Planning I (MD310)

MD410

TREATMENT PLANNING III

3 CREDITS

This course focuses on 3D treatment planning for the following body sites: Lung, prostate, breast, and head/neck. Emphasis is placed on patient positioning and immobilization, imaging, 3D geometry definition, treatment planning system functionality, treatment planning, dose verification, and terminology.

Prerequisite: Treatment Planning II (MD311)

MD411

TREATMENT PLANNING IV

3 CREDITS

This course focuses on 3D treatment planning for the following treatment modalities: IORT, Electron Arc, TBI X-ray, and TBE-Electron. Emphasis is placed on: Patient Positioning & Immobilization, Imaging, 3D Geometry Definition, Treatment Planning System Functionality, Treatment Planning, Dose Verification, Plan Verification, and Terminology.

Prerequisite: Treatment Planning III (MD410)

MD320

CLINICAL ROTATION I

4 CREDITS

This is a clinically oriented course with a focus on simulation, treatment planning techniques, and plan evaluation.

MD321

CLINICAL ROTATION II

4 CREDITS

This is a clinically oriented course with a focus on simulation, treatment planning techniques, and plan evaluation.

Prerequisite: Clinical Rotation I (MD320)

MD420

CLINICAL ROTATION III

4 CREDITS

This is a clinically oriented course with a focus on simulation, treatment planning techniques, and plan evaluation.

Prerequisite: Clinical Rotation II (MD321)

MD421

CLINICAL ROTATION IV

4 CREDITS

This is a clinically oriented course with a focus on simulation, treatment planning techniques, and plan evaluation.

Prerequisite: Clinical Rotation III (MD420)

MD499

CLINICAL INTERNSHIP

4 CREDITS

The student participates in a 15 week clinical internship. The internship is designed to give the student laboratory/clinical instruction in specific areas of medical physics and dosimetry practice. The student keeps a daily journal of their progress on each of the course competencies, to include not only assigned calculations and discussion but also relevant notes and observations on clinical practice.

This course is worth 4 credit hours. Students can expect 180 hours of clinical time consisting of a maximum of 12 hours per week spent in the clinical setting for 15 weeks. The student can expect to spend approximately 60 hours (4 hours per week) on prep work, case study, discussions, etc.

MD351

INTRODUCTION TO MEDICAL PHYSICS

3 CREDITS

This course serves as a basic introduction to the Medical Physics field, covering all four of its sub-specialties. The student will be introduced to radiation therapy, diagnostic imaging, nuclear medicine, and health physics/radiation safety. These topics will include measurement and calculation of radiation dose in humans, radiation biology, and modern technologies such as stereotactic radiosurgery and brachytherapy. Upon completing the course, the student will have a broad understanding of the widespread applications of physics in the medical field.

MD352

IMAGING ANATOMY

3 CREDITS

This course provides a detailed study of the central nervous system, thorax, abdomen, pelvis, and musculoskeletal system as demonstrated on magnetic resonance imaging and computed tomography. Anatomy will be demonstrated in transverse, sagittal, and coronal sectional imaging planes. Homework exercises and quizzes are provided weekly in order to prepare for the midterm and final examinations.

Prerequisite: one semester of Anatomy

MD205

INTRODUCTION TO RADIATION THERAPY PLANNING

3 CREDITS

This course will focus on treatment planning and dose calculations utilizing different types of treatment modalities as well as different field arrangements.

MD403

ADVANCED IMAGING

3 CREDITS

To provide students with the basic knowledge of advanced imaging technologies such as Computed Tomography (CT), Ultrasound (US), Magnetic Resonance Imaging (MRI), and Positron Emission Tomography (PET).

MD405

ALTERNATIVE MODALITIES-PROTON THERAPY

3 CREDITS

This course gives the student a background in the fundamental science underlying proton and heavy ion therapy. The radiological physics of these particles is treated first to give the student background necessary for the remainder of the course. The remainder of the course emphasizes the unique challenges faced with treatment planning for the various body sites to include: immobilization, simulation, contouring, planning, plan review, patient QA, IGRT, and proton treatment delivery.

RTT100

ORIENTATION FOR RADIOLOGICAL SCIENCES

2 CREDITS

This course provides an introduction to radiological sciences and the practitioner's role in the health care delivery system.

BIOL352

IMAGING AND SECTIONAL ANATOMY

4 CREDITS

This course provides a detailed study of the central nervous system, thorax, abdomen, pelvis, and musculoskeletal system as demonstrated on magnetic resonance imaging and computed tomography. Anatomy will be demonstrated in transverse, sagittal, and coronal sectional imaging planes. An introduction to fundamental physics in the medical imaging profession will be included. Fundamental concepts are applied to the system design of each imaging component presented.

RTT301  
CLINICAL ONCOLOGY I  
3 CREDITS

This course focuses on current clinical practice of radiation therapy for cancers of the skin, brain, head and neck, lung, and gastrointestinal tract.

RTT303  
RADIATION THERAPY TECHNICAL I  
3 CREDITS

This course focuses on the technical aspects of patient setup for radiation treatment delivery to various anatomical sites.

RTT306  
PRINCIPLES/PRACTICES OF RADIATION THERAPY  
3 CREDITS

This course focuses on historic and current aspects of cancer treatment along with basic principles and practice of treatment and simulation.

RTT311  
CLINICAL ONCOLOGY II  
3 CREDITS

This course focuses on current clinical practice of radiation therapy for cancers of the genitourinary, breast, lymphoreticular, musculoskeletal, hematopoietic, endocrine systems, and CNS, as well as pediatric cancers and benign masses.

Prerequisite: Clinical Oncology I (RTT301)

SCI390  
MEDICAL AND PROFESSIONAL ETHICS/PATIENT CARE  
1 CREDIT

This course provides an introduction to patient care and law and ethics in health care.

RTT315  
PHYSICS OF RADIATION THERAPY II  
3 CREDITS

This course focuses on the clinical aspects of radiation therapy physics examining factors related to absorbed dose, calculation of dose from all sources of radiation, principles of treatment planning, and advanced technologies.

Prerequisite: Physics of Radiation Therapy I (RTT305)

RTT410  
DOSIMETRY/TREATMENT PLANNING I  
3 CREDITS

This course focuses on basic concepts of treatment planning utilized in radiation oncology. Basic calculations for patients undergoing radiation treatments will be emphasized.

RTT412  
DOSIMETRY/TREATMENT PLANNING II  
3 CREDITS

This course focuses on more complex techniques in planning a patient's radiation treatment. Various external beam and brachytherapy planning techniques are emphasized.

Prerequisite: Dosimetry/Treatment Planning I (RTT410)

RTT414  
QA & RADIATION SAFETY  
3 CREDITS

This course focuses on the integral role of quality assurance and radiation safety in radiation oncology.

RTT490  
COMPREHENSIVE/EXAM REVIEW  
3 CREDITS

This is the culminating course for radiation therapy students and focuses on preparing students for registry examination, as well as necessary preparation steps for a successful job search and career development.

Prerequisites: Clinical Oncology I (RTT301), Clinical Oncology II (RTT311), Dosimetry/Treatment Planning I (RTT410), Dosimetry/Treatment Planning II (RTT412), Clinical Rotation I (RTT320), Clinical Rotation II (RTT321), and Clinical Rotation III (RTT420). Since this is the culminating course for the program, permission of the Instructor is required prior to enrolling in this course.

RTT400  
ADVANCED RADIATION THERAPY TECHNIQUES  
3 CREDITS

This course focuses on advanced technical aspects of patient setup and planning for radiation treatment delivery to various anatomical sites.

RTT431  
ADVANCED PATIENT CARE IN ONCOLOGIC MEDICINE  
3 CREDITS

This course focuses on evidence based nursing management of patients diagnosed with neoplastic diseases. General patient management topics will be addressed. Also, specific care needs of patients receiving radiation, chemotherapy, biologic therapy, and surgery will be presented.

RTT435  
RESEARCH METHODS  
3 CREDITS

This course focuses on evidence based research concepts. Introduction to research terminology, proposal development, and research applicability in healthcare and radiation oncology will be covered.

RTT436

DIRECTED RESEARCH IN RADIATION THERAPY

4 CREDITS

This course focuses on planning and/or implementing an evidence based research study in radiation therapy.

RTT440

CLINICAL QUALITY IMPROVEMENT AND ACCREDITATION

2 CREDITS

This course focuses on evidence based clinical quality improvement initiatives. Requirements for accreditation by various radiation oncology department accrediting organizations will also be addressed.

RTT320

CLINICAL ROTATION I

4 CREDITS

This clinical rotation is designed to provide clinical experiences in areas of radiation therapy simulation and treatment. The student will keep a daily journal of clinical experiences as well as complete clinical competencies on patients undergoing radiation therapy.

This course is worth 4 credit hours. Students can expect a minimum of 180 hours of work for this course. This consists of at least 180 hours (approximately 12-15 hours per week) spent in the clinical setting. Students should expect to spend additional time outside of the clinic on preparation work needed to ensure success.

RTT321

CLINICAL ROTATION II

3 CREDITS

This clinical rotation is designed to provide clinical experiences in areas of radiation therapy simulation and treatment. The student will keep a daily journal of clinical experiences as well as complete clinical competencies on patients undergoing radiation therapy.

This course is worth 3 credit hours. Students can expect a minimum of 135 hours of work for this course. This consists of at least 135 hours (approximately 8-10 hours per week) spent in the clinical setting. Students should expect to spend additional time outside of the clinic on preparation work as needed to ensure success.

Prerequisite: Clinical Rotation I (RTT320)

RTT420

CLINICAL ROTATION III

4 CREDITS

This clinical rotation is designed to provide clinical experiences in areas of radiation therapy simulation and treatment. The student will keep a daily journal of clinical experiences as well as complete clinical competencies on patients undergoing radiation therapy.

This course is worth 4 credit hours. Students can expect a minimum of 180 hours of work for this course. This consists of at least 180 hours (approximately 12-15 hours per week) spent in the clinical setting. Students should expect to spend additional time outside of the clinic on preparation work as needed to ensure success.

Prerequisite: Clinical Rotation II (RTT321)

RTT421

CLINICAL ROTATION IV

4 CREDITS

This clinical rotation is designed to provide clinical experiences in areas of radiation therapy simulation, treatment, and medical dosimetry. The student will keep a daily journal of clinical experiences as well as complete clinical competencies on patients undergoing radiation therapy.

This course is worth 4 credit hours. Students can expect a minimum of 180 hours of work for this course. This consists of at least 180 hours (approximately 12-16 hours per week) spent in the clinical setting. Students should expect to spend additional time outside of the clinic on preparation work as needed to ensure success.

Prerequisite: Clinical Rotation III (RTT420)

RTT351

INTRODUCTION TO MEDICAL PHYSICS

1 CREDIT

This course serves as a basic introduction to the Medical Physics field, covering all four of its sub-specialties. The student will be introduced to radiation therapy, diagnostic imaging, nuclear medicine, and health physics/radiation safety. These topics will include measurement and calculation of radiation dose in humans, radiation biology, and modern technologies such as stereotactic radio surgery and brachytherapy. Upon completing the course, the student will have a broad understanding of the widespread applications of physics in the medical field.

SCI300

INTRODUCTION TO CANCER CARE AND NANOMEDICINE

2 CREDITS

This course focuses on nanomedicine and its role in the treatment of cancer.

RTT430

RADIATION THERAPY DEPARTMENT MANAGEMENT

2 CREDITS

This course focuses on management techniques for medical professionals in radiation therapy. Emphasis is placed on an introduction to general management theories and techniques. Managing radiation oncology professionals will be discussed in detail. This is a case-based course in which students will learn to apply management concepts within the organization and department.

MI301  
INTRODUCTION TO NUCLEAR MEDICINE/PET  
3 CREDITS

Introductory course in nuclear medicine focusing on radionuclide sources, radiation detection equipment, radiopharmaceutical characteristics and their use in nuclear medicine procedures.

MI303  
INTRODUCTION TO CT/MRI  
3 CREDITS

This course provides the student with an introduction to the functions and basic procedures of computed tomography and magnetic resonance imaging.

MI307  
INTRODUCTION TO ULTRASOUND  
3 CREDITS

This course provides the student with an introduction to the functions and basic procedures of ultrasound imaging.

MI309  
CLINICAL MANAGEMENT  
3 CREDITS

This course provides a detailed study of critical thinking and decision making in the clinical setting. Basic terminology used in clinical decision making is introduced. This course focuses on identifying the qualities of a critical thinker through the review of numerous case studies and critical analysis of radiographs and situations. Case studies relevant to critical thinking are presented and evaluated.

MI310  
PATHOLOGY AND DISEASE  
3 CREDITS

This course provides a detailed study of pathology, illness, and disease in the human body. Basic terminology used in pathology and disease management will be introduced. Classification and causes of disease in body systems including nervous, gastrointestinal, reproductive, circulatory, respiratory, and muscular. Radiologic pathology will be emphasized.

MI330  
LEADERSHIP AND COMMUNICATION  
3 CREDITS

Introductory course in understanding the characteristics of leadership, the different forms in which it appears, and how it is applied and communicated.

CT390  
CLINICAL I – CT  
6 CREDITS

This course provides the student with an introduction to the functions and basic procedures of computed tomography clinical practice. This course includes an overview of the field of CT, ethics, patient care, and professional standards. This course provides the student with an introduction to the functions and basic procedures of computed tomography to prepare them for clinical practice in CT. Students will learn concepts in the clinical application of imaging skills of the head, skull, neck, cervical spine, thoracic spine, lumbar spine, pelvis, hip, knee, and extremity. Imaging for trauma cases will also be presented.

#### CT391

##### CLINICAL II – CT

6 CREDITS

This course provides the student with a more advanced understanding of procedures of computed tomography clinical practice. Students will learn concepts in the clinical application of imaging skills of the cardiac, abdomen, pediatric, and special procedures. Imaging post processing, bariatric procedures, radiation therapy imaging, CT/PET, and imaging quality assurance will also be presented.

Prerequisite: Clinical I - CT

#### CT490

##### CLINICAL III – CT

6 CREDITS

In this course, the student will begin the clinical internship experience. This course includes advanced instruction and clinical application of imaging skills of the following examinations: head, skull, neck, cervical spine, thoracic spine, lumbar spine, thorax (lungs), abdomen, pelvis, hip, knee, and extremity. All CT procedures will be performed under the supervision of a registered CT technologist.

Prerequisite: Clinical II - CT

#### CT491

##### CLINICAL IV – CT

6 CREDITS

In this course, the student will continue the clinical internship experience. This course includes advanced instruction and clinical application of imaging skills of the following: cardiac, abdomen, pediatric, special applications, image post processing, bariatric procedures, radiation therapy imaging, CT/PET, and imaging quality assurance. All CT procedures will be performed under the supervision of a registered CT technologist.

Prerequisite: Clinical III - CT

#### CT401

##### ADVANCED TECHNIQUES I – CT

3 CREDITS

This course provides the student with an in-depth understanding of clinical procedures in computed tomography imaging. This course will also provide the student with an understanding of responsible imaging practices.

**CT403**

**ADVANCED TECHNIQUES II – CT**

**3 CREDITS**

This course provides the student with an in-depth understanding of quality assurance procedures in computed tomography. This course will also provide the student with an understanding of differences and similarities between various CT scanning equipment currently available on the market.

Prerequisite: Advanced Techniques I - CT

**CT410**

**CAPSTONE COURSE – CT**

**2 CREDITS**

This course is a capstone seminar where selected topics related to computed tomography are reviewed with emphasis on the vast knowledge base required of a CT technologist. Students will also be instructed in standardized test taking skills and effective study habits.

**MR390**

**CLINICAL I – MRI**

**6 CREDITS**

This course provides students with an introduction to clinical practice to prepare them for professional performance of MRI studies. This course provides the student with an introduction to the functions and basic procedures of magnetic resonance imaging clinical practice. This course includes an overview of the field of MRI, ethics, patient care, venipuncture, and professional standards. Students will also be introduced to MRI technique and instrumentation.

**MR391**

**CLINICAL II – MRI**

**6 CREDITS**

This course provides the student with a more advanced understanding of procedures of magnetic resonance imaging clinical practice. This course provides students with knowledge of theory and practice for the following MRI examinations: brain, head, neck, spine, thorax, breast, pelvis, and musculoskeletal areas of the body. Imaging post processing, functional MRI, spectroscopy, angiography, and quality control topics will also be presented.

Prerequisite: Clinical I - MRI

**MR490**

**CLINICAL III – MRI**

**6 CREDITS**

In this course, the student will begin the clinical internship experience. This course includes advanced instruction and clinical application of imaging skills of the following examinations: head, skull, neck, cervical spine, thoracic spine, lumbar spine, thorax, breast, abdomen, pelvis, and musculoskeletal. All MRI procedures will be performed under the supervision of a registered MRI technologist.

Prerequisite: Clinical II - MRI

MR491

CLINICAL IV – MRI

6 CREDITS

In this course, the student will continue the clinical internship experience. This course includes advanced instruction and clinical application of imaging skills of the following: cardiac, retroperitoneum, pediatric, special applications, image post processing, perfusion, diffusion, spectroscopy, fMRI, and quality assurance. All MRI procedures will be performed under the supervision of a registered MRI technologist.

Prerequisite: Clinical III - MRI

MR401

ADVANCED TECHNIQUES I – MRI

3 CREDITS

This course provides the student with an in-depth understanding of clinical procedures in magnetic resonance imaging. This course will also provide the student with an understanding of responsible imaging practices.

MR403

ADVANCED TECHNIQUES II – MRI

3 CREDITS

This course provides the student with an in-depth understanding of quality assurance procedures in MRI. This course will also provide the student with an understanding of differences and similarities between various MRI imaging equipment currently available on the market.

Prerequisite: Advanced Techniques I - MRI

MR410

CAPSTONE COURSE – MRI

2 CREDITS

Capstone seminar where selected topics related to magnetic resonance are reviewed with emphasis on the vast knowledge base required of a MRI technologist. Students will also be instructed in standardized test taking skills and effective study habits.

NM390

CLINICAL I – NM

6 CREDITS

This course provides students with an introduction to clinical practice to prepare them for professional performance of Nuclear Medicine diagnostic and therapeutic procedures. This course provides the student with an introduction to the functions and basic procedures of nuclear medicine clinical practice. This course includes an overview of the field of nuclear medicine, ethics, patient care, venipuncture, and professional standards. Students will also be introduced to clinical nuclear medicine techniques and instrumentation.

NM391

CLINICAL II – NM

6 CREDITS

This course provides the student with a more advanced understanding of procedures of nuclear medicine clinical practice. This course provides students with knowledge of theory and practice for nuclear medicine diagnostic procedures for the following body systems: skeletal, cardiovascular, central nervous system, digestive, endocrine/exocrine, genitourinary, and respiratory.

Radiopharmaceutical and radionuclide use in nuclear medicine will also be addressed in this course.

Prerequisite: Clinical I - NM

NM490

CLINICAL III – NM

6 CREDITS

In this course, the student will begin the clinical internship experience. This course provides the student with a more advanced understanding of procedures of nuclear medicine clinical practice including oncology, hematology, bone marrow, inflammation, and infection. Radionuclide therapy and quality control topics will also be presented. All clinical nuclear medicine procedures will be performed under the supervision of a registered nuclear medicine technologist.

Prerequisite: Clinical II - NM

NM491

CLINICAL IV – NM

6 CREDITS

In this course, the student will continue the clinical internship experience. This course includes advanced instruction of the following: diagnostic and therapeutic procedures in NM, PET, PET/CT, SPECT, and clinical quality control procedures. All clinical nuclear medicine procedures will be performed under the supervision of a registered nuclear medicine technologist.

Prerequisite: Clinical III - NM

NM401

ADVANCED TECHNIQUES I – NM

3 CREDITS

This course provides the student with an in-depth understanding of clinical procedures in nuclear medicine professional practice. This course will also provide the student with an understanding of responsible imaging practices.

NM403

ADVANCED TECHNIQUES II – NM

3 CREDITS

This course provides the student with an in-depth understanding of therapeutic clinical procedures in nuclear medicine professional practice. This course also provides the student with an understanding of action levels and appropriate actions for addressing quality assurance/control issues in the clinical setting. Also addressed will be emerging technologies in therapeutic nuclear medicine.

Prerequisite: Advanced Techniques I - NM

NM410  
CAPSTONE COURSE – NM  
2 CREDITS

Capstone seminar where selected topics related to nuclear medicine are reviewed with emphasis on the vast knowledge base required of a nuclear medicine technologist. Students are also instructed in standardized test taking skills and effective study habits.

US390  
CLINICAL I – US  
6 CREDITS

This course provides the student with an introduction to the functions and basic procedures for ultrasound imaging. Learn to apply principles of ultrasound in the operation of medical sonographic equipment to produce a sonogram. Incorporate ergonomic principles to avoid negative short and long-term consequences of scanning. Learn to perform sonographic studies of the abdomen.

US391  
CLINICAL II – US  
6 CREDITS

This course continues to build on the concepts taught during Clinical 1 Ultrasound. To improve upon applying principles of ultrasound in the operation of medical sonographic equipment to produce a sonogram. Learn to perform sonographic studies of the pelvis, superficial structures, and abdominal Doppler.

Prerequisite: Clinical I - US

US490  
CLINICAL III – US  
6 CREDITS

A health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts. This course continues to build on the concepts taught during Clinical 1 and 2 Ultrasound. Learn to perform obstetric sonographic studies.

Prerequisite: Clinical II - Ultrasound

US491  
CLINICAL IV – US  
6 CREDITS

A health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts. This course continues to build on the concepts taught during Clinical 1 - 3 Ultrasound. Be introduced to vascular sonography.

Prerequisite: Clinical III – Ultrasound

US401  
ADVANCED TECHNIQUES I – US  
3 CREDITS

This course continues to build on the concepts taught during Clinical 1 - 2 Ultrasound. To continue to improve upon applying principles of ultrasound in the operation of medical sonographic equipment to produce a sonogram. Gain exposure to advanced techniques and current research.

US403

ADVANCED TECHNIQUES II – US

3 CREDITS

This course continues to build on the concepts taught during Clinical 1 - 3 Ultrasound and Advanced Techniques 1. To continue to improve upon applying principles of ultrasound in the operation of medical sonographic equipment to produce a sonogram. Continue to gain exposure to advanced techniques and current research.

Prerequisite: Advanced Techniques I - US

US410

CAPSTONE COURSE – US

2 CREDITS

Capstone seminar where selected topics related to sonography are reviewed with emphasis on the vast knowledge base required of a Sonographer. Students will also be instructed in standardized test taking skills and effective study habits.

PHY201

GENERAL PHYSICS I

3 CREDITS

This is an introductory course designed specifically for the student who has not taken a calculus-based general physics course, but is preparing for a career in medical physics. The combination of General Physics I and II will be adequate preparation for later upper-level physics courses. The course is designed to develop the ability to think as a physicist, rather than to survey physical science. To this end, the course will deal with the mechanics of particles and rigid bodies, the mechanics of fluids, and thermodynamics. These topics represent an increasing complexity.

PHY202

GENERAL PHYSICS II

3 CREDITS

This is the sequel to General Physics I. A student prepared in the calculus and vector analysis can take this course before General Physics I, but both courses must be taken. The course includes a historical introduction to electromagnetic fields following a detailed treatment of the concepts and laws. Gauss', Oersted's, and Ampere's Laws, and Maxwell's displacement current are central. Energy of the fields and storage elements in circuit theory and practical circuit analysis are treated. Electromagnetic (radio and light) waves are introduced.

Prerequisite: General Physics I (PHY201)

PHY301

MODERN PHYSICS

3 CREDITS

This course serves as a transition from the general, historical physics principles covered in a general physics course and the more modern concepts of quantum mechanics, solid state physics, and relativity that are pertinent to the study of modern-day physics. A range of topics are covered in an introductory fashion so that students are familiarized with the background material they will need to succeed in upper-level physics courses.

Prerequisite: General Physics II (PHY202)

#### PHY401

#### ELECTRICITY AND MAGNETISM

3 CREDITS

This is an advanced treatment of the material in General Physics II. There is a mathematical introduction to the vector calculus and the solution of differential equations. The student, however, should be familiar with the calculus and vector analysis. The course is designed to develop first Maxwell's electromagnetic field equations from the classic experiments that led to them. The motion of charges, waves, and wave energies and momenta are then developed. Einstein's special theory of relativity ties fields and particle motion together.

Prerequisite: Modern Physics (PHY301) concurrent or completed

#### PHY403

#### FUNDAMENTALS OF NUCLEAR PHYSICS

3 CREDITS

A strong foundation in nuclear physics is a fundamental component of any physicist's tool chest. This is especially true of the medical physicist whose bread and butter is radiation science. In this course, the student is introduced to a broad swath of topics in nuclear physics. First, quantum mechanics are treated briefly to the depth necessary for the rest of the material. Nuclear properties essential to understanding the rest of the course are covered. General principles of radioactive decay are discussed, followed by in-depth discussions of alpha, beta, and gamma decays. The last planned topic is neutron physics, although the chapter on nuclear reactions will be covered if there is time.

Prerequisite: Modern Physics (PHY301) concurrent or completed

#### PHY405

#### THERMODYNAMICS

3 CREDITS

This course introduces the student to the basic concepts and laws of thermodynamics. A mathematical introduction is included in the course, although the student must be familiar with the calculus. With the aim of making the approach as simple as possible the thermodynamic potentials (internal energy, enthalpy, Helmholtz energy, and Gibbs energy) are introduced as soon as possible and the remainder of the course built upon them. The molecular picture of matter, statistical mechanics, irreversibility, entropy production, chemical thermodynamics, reaction kinetics, and transition state theory are treated. The course ends with a treatment of phase transitions.

Prerequisite: Modern Physics (PHY301) concurrent or completed

#### PHY407

#### QUANTUM MACHANICS

3 CREDITS

This is an introduction to quantum mechanics and the language of the Dirac vectors, on which modern treatments are based. The course begins with an introduction to Dirac vectors and transformations based on the requirements of what experiment tells us. Familiarity will develop as we encounter momentum, angular momentum, and atoms. The course ends with a treatment of atoms and spectra. Prerequisite: Modern Physics (PHY301) concurrent or completed

PHY409  
ANALYTICAL MECHANICS  
3 CREDITS

This is an introduction to modern mechanical treatment of the motion of particles and rigid bodies. The course is based on Lagrange and Hamiltonian mechanics the basic principles of which are developed at the beginning of the course. The student should have an understanding of the calculus. The course is designed for learning by application. Each topic is introduced as briefly as possible and then the student will engage the application.

Prerequisite: Modern Physics (PHY301) concurrent or completed

BIOL301  
HUMAN ANATOMY AND PHYSIOLOGY  
4 CREDITS

This course is intended to provide the student with an overview of human anatomy and physiology in the framework of organ systems. The course is aimed at an audience of non-physician medical professionals, and as part of that end the anatomical component of the course emphasizes cross-sectional anatomy as seen on planar and cross-sectional medical imaging such as CT, PET, and MRI images.

MATH201  
CALCULUS I  
3 CREDITS

This course is the first in a series of two designed to familiarize the student with the calculus. This particular course covers the fundamentals of calculus: the derivative and integral. It also covers a selection of topics to prepare the student for the second course in the series.

MATH202  
CALCULUS II  
3 CREDITS

This course is the second in a series of two designed to familiarize the student with the calculus. Satisfactory completion of Calculus I is required prior to taking Calculus II. This course starts with a brief introduction of the concepts of vectors, in order to build a discussion of vector-valued functions. This discussion contributes to the development of concepts of three-space necessary to the rest of the course. Partial derivatives, multiple integrals, and line and surface integrals make up the remainder of the course. The latter part of this course is especially applicable to the understanding of physics concepts, and it is the ultimate object of this course to prepare students to use those concepts in their further work in physics.

Prerequisite: Calculus I (MATH201)

PHY420  
PHYSICS OF RADIATION DOSIMETRY  
3 CREDITS

This course focuses on introducing radiation terminology used in radiation dosimetry. Fundamental dose calculation theories are reviewed and an emphasis is placed on clinical and radiation safety related dosimetry techniques.

PHY425  
PHYSICS OF RADIATION BIOLOGY  
3 CREDITS

This course focuses on introducing fundamental radiation biology concepts. Emphasis is placed on radiation interactions, cell damage, cell survival curves, cell sensitivity and response, factors affecting cell response, tissue kinetics, effects on the fetus, biological models, and radiobiological risk assessment.

PHY203  
PHYSICS III  
3 CREDITS

**Essential Topics:** Magnetic Field and Magnetic Forces: Bar Magnets, Monopole and Dipole, Geomagnetism; Sources of Magnetic Field; Magnetic Field Lines and vectors; Biot-Savart Law; Oersted's Experiment; Ampere's Experiment; Magnetic Force and Right Hand Rule; Magnetic Field of Current; Magnetic Dipole; Ampere's Law and Applications; Magnetic Field of Solenoids; Lorentz Force; Motion of the Charge in both Uniform Magnetic and Electric Fields combined; The Earth's Van Allen Belt; The Hall Effect; The Magnetic Force on a Current Carrying Wire; Force Between Parallel wires; Forces and Torque on a Current Loop; An Electric Motor; Atomic Magnets; Ferromagnetism; Magnetic Flux; Faraday's Law of Electromagnetic Induction; Motional EMF; Lenz Law; Induced Currents and Applications; Inductors; Mutual Inductance; Potential Across an Inductor; Energy in Inductors and Magnetic Field; LR Circuits; LC Circuits;  
Concept of Oscillations and Waves: Simple Harmonic Motion; Kinematics and Dynamics of Mechanical Oscillations; Simple and Physical Pendulum; Concept of Waves; Traveling Waves; Concept of Interference; Standing Waves;

Concept of Electromagnetic Waves: Maxwell's Equations; Wave Equation; Energy and Momentum in Electromagnetic Waves; Power and Intensity; Polarization; Interference of Light Waves; Young's Double Slit Interference; Concept of Diffraction; Single-Slit Diffraction; Circular Aperture Diffraction; Resolution of Optical Instruments; Multiple Slit Diffraction;

Concept of Geometrical Optics: Reflection and Refraction; Image Formation by Spherical Mirrors (Concave and Convex); Mirror's Equation; Magnification of the Mirror; Index of Refraction; Snell's Law; Total Internal Refraction; Optical Fibers; Brewster's Angle; Dispersion Phenomenon; Image Formation by Refraction; Thin Spherical Lenses (Concave and Convex); Lens Equation; Lens Magnification; Image Formation by Multiple Lenses and mirrors.

**Additional Topics (On Instructor's Choice):** may include Introduction to Relativity: Postulates of Relativity, The Relativity of Simultaneity, Time Dilation, Twins Paradox, Length Contraction; and other topics.

Prerequisite: General Physics II (PHY202)

PHY201L  
PHYSICS LAB I  
2 CREDITS

This is a complimentary part to the Physics I course of lectures. The specific content of experiments depends on availability of equipment and on choice of Instructor.

PHY202L  
PHYSICS LAB II  
2 CREDITS

This is a complimentary part to the Physics I course of lectures. The specific content of experiments depends on availability of equipment and on choice of Instructor.

Prerequisite: Physics Lab I (PHY201L)

PHY203L  
PHYSICS LAB II  
2 CREDITS

This is a complimentary part to the Physics I course of lectures. The specific content of experiments depends on availability of equipment and on choice of Instructor.

Prerequisite: Physics Lab II (PHY202L)

PHY430  
SEMINAR I  
1 CREDIT

The content of Seminar I course is open for Instructor's choice.

PHY431  
SEMINAR II  
1 CREDIT

The topics to be covered may vary and the textbook choice is determined by Instructor. Proposed topics may include but not limited:

- New Science and Technological Frontiers in 21<sup>st</sup> Century
- Main Components of the Research Process
- Research Project: Interaction of the Laser Radiation with Bone Tissue.
- Developing a Theoretical Model and Setting Up Limitations
- Real Life Research Example
- Developing computer software.
- Writing a Research Report/Paper
- Example of the Research Paper
- Examples of Fundamental Research Projects. **Part 1:** Super High Energy Lasers Based on a PBCR; Wave Optics and Applications; Quantum Optics
- Nanomedicine Overview I: Definitions; A brief history; Nanodreams; Nanohorrors; Applications of Nanomedicine

- Nanomedicine Overview II: Applications of Nanomedicine; Properties of Medical Nanodevices: Shape and Size, Biocompatibility, Powering, Communication, Navigation, Summary

Examples of Fundamental Research Projects. **Part 2:** New Dynamic Modes in Selective Nano-Photothermolysis of Cancer Cells: Cluster Aggregation Mode, Bubbles Overlapping Mode, Thermal Explosion Mode

MATH303

INTRODUCTION TO DIFFERENTIAL EQUATIONS

3 CREDITS

The topics to be covered may vary and the textbook choice is determined by Instructor. Taking this course the student will demonstrate following competencies in:

Verify that an indicated function is a solution of given differential equations.

Find a differential equation describing certain situations.

Find a solution to initial value problems.

- Use various techniques for solving differential equations.
- Identify linear second-order differential equations as to being homogeneous or nonhomogeneous
- Find the general solution of homogeneous and nonhomogeneous linear second-order differential equations.
- Use matrices to obtain the general solution to a homogeneous system of linear differential equations.
- Obtain an approximate numerical value solution of an initial value problem

Prerequisite: Calculus II (MATH202)

PHY460

COMPUTATIONAL PHYSICS

3 CREDITS

The topics to be covered may vary and the textbook choice is determined by Instructor. Proposed topics may include but not limited:

- The computer simulations of the optical, electrical and mechanical properties of individual nanoparticles; the concept of surface plasmons on metal nanoparticles; spectral control of the plasmon resonance by tuning shape, size, and dielectric environment.
- The computer simulations of the nanoparticle's thermodynamics and heat diffusion into surrounding medium.
- The computer simulations of the arrays of interacting metal nanoparticles – nanoclusters.
- The computer simulations of laser heating and evaporation of the nanoparticles/nanoclusters in nano-, pico- and femto-second modes.
- Synthesis of nanoparticles.
- Fundamental problems of nucleation rate, evolution of size and size-distribution of nanoparticles will be presented.

PHY461

COMPUTATION NANOMEDICINE

3 CREDITS

The topics to be covered may vary and the textbook choice is determined by Instructor. Proposed topics may include but not limited:

- Nanomedicine: Introduction, Applications of Nanomedicine, Properties of Medical Nanodevices, Summary.
- Selective Nano-Photothermalolysis of Cancer Cells.
- Nano-Optics: Mie diffraction theory.
- Simulation of the Absorption and Scattering Spectrum of nanoparticles. Demonstration of the plasmon-resonance absorption effect.
- Cancer cell structure and properties.
- Optics of the cellular natural absorbers.
- Laser heating of intracellular nanostructures: Time dynamic model.
- Computer simulation of the time dynamics of the nanoparticle's temperature heated by single pulse.
- Computer simulation of the time dynamics of the nanoparticle's temperature heated by the multipulse laser radiation.
- Laser heating of the natural intracellular absorbers.
- Space distribution of the temperature field around the single nanoparticle in cell volume.
- Temperature distribution of temperature inside/outside the single nanoparticle in bio-media.
- Space distribution of the temperature around the natural intracellular absorbers.
- Nano-cluster aggregation mode of the selective nano-photothermalolysis of the cell
- Numerical solution of the heat transfer equation with many heat sources.
- Micro-bubble generation around the intracellular nanostructures.

Computer simulation of micro-bubble dynamics.

Computer simulation of the cell ablation.

New approaches. Nano-bombs: explosive evaporation, shock wave generation, and optical plasma formation.

PHY440

INTRO TO NANOTECHNOLOGY I

3 CREDITS

The topics to be covered may vary and the textbook choice is determined by Instructor. Proposed topics may include but not limited:

- Introduction and Overview: Definition of Nanotechnology; Brief History of Nanotechnology; Present State of Nanotechnology; Categories of Nanotechnology; Tools of Nanotechnology; Nanotechnology Products and Applications; Current Market in Nanotechnology
- Scaling Laws: Scaling in Mechanics; Scaling in Electricity and Magnetism
- Scaling Laws (continue): Scaling in Optics; Scaling in Heat Transfer; Scaling in Fluids; Scaling in Biology; Accuracy of the scaling Laws
- Intro to Nanoscale Physics: Introduction to Quantum Mechanics; Atomic Orbitals; Electromagnetic Waves; Quantization of Energy; Atomic Spectra and Discreteness
- Intro to Nanoscale Physics (continue): The Photoelectric Effect; Wave-Particle Duality
- Intro to Nanoscale Physics (continue): Heisenberg's Uncertainty Principle
- Intro to Nanoscale Physics (continue): Standing Waves; Particle in the Potential Well; Summary
- Nanomaterials and Fabrication: Atomic Bonding; Ionic Bonding; Covalent Bonding; Metallic Bonding; Van der Waals Forces: The Dispersion Force, Repulsive Force; Examples
- Nanomaterials and Fabrication: Crystal Structure; Nanostructures; Nanoparticles; Properties of Nanoparticles; Synthesis of Nanoparticles; Application of Nanoparticles in Medicine

Nanostructures: Nanowires; Nanofilms; Nanopores; Small-Grained Materials; Carbon Fullerenes; Carbon nanotubes; Summary

PHY441

INTRO TO NANOTECHNOLOGY II

3 CREDITS

The topics to be covered may vary and the textbook choice is determined by Instructor. Proposed topics may include but not limited:

- Nanomechanics: Introduction to Nanomechanics; Brief Review of Kinematics; Brief Review of Dynamics
- Nanomechanical Oscillations: Definition and examples of Oscillations; Introduction to Simple Harmonic Motion; Kinematics of Simple Harmonic Motion; Horizontal spring & mass; Vertical spring & mass; The energy approach; Dynamics of SHM; Sinusoidal Nature of SHM
- Nanomechanical Oscillations (continue...): Sinusoidal Nature of SHM; The simple pendulum; The rod pendulum
- Nanomechanical Oscillations (continue...): Forced Oscillation; Oscillating Atoms: Classical Mechanics; Quantum Mechanics of Oscillating Atoms; Quantum Harmonic Oscillator; The Corresponding Principle
- Nanomechanical Oscillations (continue...): Phonons; Nanomechanical Oscillator Applications: NM Memory Element, NM Mass Sensor: Detecting Low Concentrations; Scanning Probe Microscopes: Scanning Tunneling Microscope, Atomic Force Microscope, Applications of AFM; Summary of Nanomechanics
- Nanoelectronics: Introduction to Nanoelectronics; Electron Energy Bands; Electrons in Solids: Conductors, Insulators, and Semiconductors; Fermi Energy; The Density Of States for Solids
- Nanoelectronics (continue): Electron Density in a Conductor; Electron Energies in Nanomaterials; Quantum Confinement; Quantum Structures; Uses for Quantum Structures; How Small Is Small Enough for Confinement? Conductors: The Metal-to-Insulator ; Transition; Semiconductors: Confining Excitons; The Band Gap of Nanomaterials
- Nanoelectronics (continue): Tunneling; The Scanning Tunneling Microscope; Single Electron Phenomena; Two Rules for Keeping the Quantum in Quantum Dots; Rule 1: The Coulomb Blockade; Rule 2: Overcoming Uncertainty; The Single-Electron Transistor; Molecular Electronics; Summary
- Nanoscale Heat Transfer: Conduction; Convection; Radiation; Laser Heating of Nanoparticles

Nanophotonics: Photonic Properties of Nanomaterials; Plasmon Resonance Effect; Near-Field Light; Optical Tweezers; Photonic Crystals

Prerequisite: Intro to Nanotechnology I (PHY440)

PHY450

BIOMEDICAL OPTICS

3 CREDITS

The topics to be covered may vary and the textbook choice is determined by Instructor. Proposed topics may include but not limited:

- Interaction of the Radiation with Biological Media
- Photoelectric Effect, Compton Effect, Pair Production
- Radiation Generation
- Laser Fundamental, Types and Properties of Radiation
- Introduction to the Imaging Modalities
- Laser Ablation of Biological Tissues and Laser Surgery
- Introduction to the Imaging Modalities (Continue)
- Fiber Optics and Fiber Optics Biosensors

PHY427

PHYSICS OF NUCLEAR MEDICINE

3 CREDITS

The topics to be covered may vary and the textbook choice is determined by Instructor. Proposed topics may include but not limited:

- Introduction to MIRD
- MIRD Calculations
- Microsphere Treatment
- PET Imaging
- I-131 Dosimetry
- Radioimmuno Detection and Therapy
- Future of Nuclear Medicine

PHY432

DIRECTED RESEARCH

4 CREDITS

The content of Directed Research projects is open for Instructor choice.

PHY433

INTERNSHIP

4 CREDITS

The content of Directed Research projects is open for Instructor choice.

(May replace Directed Research (PHY432) in the Nanomedicine concentration)

# GRADUATE PROGRAM STUDENT HANDBOOK

## 2015 – 2016 Academic Calendar

### Fall 2015

Application Due Date	August 10, 2015
Semester Start	September 7, 2015
Boot Camp Week	November 14-20, 2015
Fall Break	November 23-27, 2015
Semester End	December 18, 2015

### Spring 2016

Application Due Date	December 15, 2015
Semester Start	January 4, 2016
Boot Camp Week	March 14-20, 2016
Spring Break	March 21-25, 2016
Semester End	April 15, 2016

### Summer 2016

Application Due Date	April 11, 2016
Semester Start	May 9, 2016
Boot Camp Week	July 18-24, 2016
Summer Break	July 25-29, 2016
Semester End	August 19, 2016

### Fall 2016 Semester

Application Due Date	August 10, 2016
Semester Start	September 5, 2016
Boot Camp Week	November 12-18, 2016
Fall Break	November 21-25, 2016
Semester End	December 16, 2016

### Spring 2017 Semester

Application Due Date	December 15, 2016
Semester Start	January 9, 2017
Boot Camp Week	March 20-26, 2017
Spring Break	March 27-31, 2017
Semester End	April 21, 2017

### Summer 2017 Semester

Application Due Date	April 15, 2017
Semester Start	May 8, 2017
Boot Camp Week	July 17-23, 2017
Break Week	July 24-28, 2017
Semester End	August 18, 2017

## **Teaching Methodology**

The programs for RTU are designed to be completed in four semesters, which can run between 16 or 24 months depending on the student's preference. Students who wish to pursue a more traditional route will generally enroll for fall and spring semester, which begin in September and January respectively. Students who wish to pursue an accelerated path may enroll in all three (fall, spring and summer) 15 week semesters and complete the program in roughly 16 to 18 months.

All programs require a Clinical Internship. The Clinical Internship is designed to be completed through a host site arranged by the student and university. Specific clinical internship requirements vary by program, but in all cases involve competencies that students must complete/observe as well as writing assignments based on their experiences.

Information on required textbooks and course material will be provided prior to the start of the course. Students are responsible for securing their required course materials unless otherwise stated. The syllabus for each course will be provided no later than the first day of the course.

RTU's course management system is used to manage communication and distribute all course material. The system allows students to communicate with other students, instructors, teacher's aides, and administrative personnel. During the semester, students are able to retrieve resources for classes, course material, weekly schedules and tasks, lecture videos and supplemental lecture material through the system.

Homework assignments and assessments can also be completed online through file upload features and interactive tests and quizzes. Progress reports and comments on assignments from instructors and teacher's aides are also available through the course management system. Students are required to attend weekly conferences via teleconference, webcast, or video chat with the instructor or instructor's assistant to aide them on course material, homework assignments, and weekly topics. Choice of delivery system is at the full discretion of the instructor.

Each semester, there is a schedule of offered courses along with the day and time required for each mandatory weekly discussion. If a course is scheduled on Thursday, this means that new material for that course will be available Thursday of each week. In addition, homework assignments and assessments will typically be scheduled for Thursdays. The syllabus for each course notes that these weekly schedules are subject to change.

To help students manage their personal and professional lives along with their course work, homework can usually be submitted until 11:59pm on the day the assignment is due. Assessments are scheduled ahead of time so the students can make allowances with their schedules. If the times allotted are an issue for a student that cannot be overcome, the student may address this with their instructor or the RTU administrator ahead of time so alternatives may be arranged.

It is the student's sole responsibility to make sure they are checking messages and announcements to ensure they are reviewing and completing all that is required of them. Administrative personnel, instructors, and teacher's aides make sure information is as visible and clear as possible. Open communication between the student and RTU is promoted to make sure there is no ambiguity.

Boot camp weeks scheduled during the fall, spring and summer semesters are designed to allow students to meet and work together in a classroom setting both with each other and the instructors. Boot camp weeks include events such as: exams, lectures, student project presentations, tours, lab

sessions for some courses, visiting lecturers, study sessions, and review sessions. Attending boot camp is mandatory.

RTU awards credit based on attendance, homework project submissions, and assessments. Graduate program courses require a minimum grade of 80% (B) in order to receive credit.

### **Hardware and Software Required by the Student**

- ✓ A computer with a minimum of a Pentium processor
- ✓ High speed internet access
- ✓ Ability to stream flash videos
- ✓ Ability to read and create pdf files
- ✓ A minimum of Microsoft® Office 2003 or equivalent
- ✓ Email account
- ✓ Access to a scanner
- ✓ Access to a fax machine
- ✓ Access to a copier
- ✓ Access to a printer

### **Non-Discrimination Policy**

Radiological Technologies University is non-sectarian and does not discriminate with regard to race, creed, color, national origin, age, sex, disability or marital status in any of its academic course activities, employment practices, or admissions policies.

### **Degree Programs Offered**

#### **MASTER PROGRAMS**

Master of Science in Medical Physics (MSMP)	49 credits
Master of Medical Dosimetry (MSMD)	47 credits
Master of Science in Medical Health Physics (MSMHP)	52 credits
Master of Science in Nanomedicine (MSNM)	41 credits

### **Average Class Size**

Average class size at Radiological Technologies University is 5-10 which keep the classes small and intensive.

### **ADMISSION POLICIES**

A person's academic ability and potential for success at Radiological Technologies University are the most important factors in the school's admission decision. Full consideration is given to the applicant's academic achievement and aptitude, personal experiences, and motivation. The School does not discriminate on the basis of such factors as national or ethnic origin, race, color, age, gender, sexual orientation, marital status, religion, disability or veteran status.

Students that have submitted an application will receive full acceptance, no acceptance, or conditional acceptance. Conditional acceptance suggests the applicant will receive full acceptance once pre-requisites and/or graduate record examination scores are submitted. Students that have received conditional acceptance to the Medical Physics Program may receive full acceptance to the Master of Medical Dosimetry Program.

The accepted applicant for Masters level programs must possess a Bachelor's Degree from an accredited or approved institution or equivalent. Bachelor's Degree equivalency may be recognized if the student can show acceptable undergraduate college work through transcripts and extensive professional level, work experience, or more than four years of acceptable undergraduate college work.

International students (and U.S. students with international transcripts) must have a course by course evaluation of international transcripts by an approved private company, such as World Education Services, or other National Association of Credential Evaluation Services (NACES) to determine the equivalency.

Applicants whose first language is not English or language of the instruction is not English must submit English proficiency examination scores. The minimum TOEFL (Test of English as a Foreign Language) score required is 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The minimum IELTS (International English Language Testing System) score required is 6.5.

### **Admission Procedure for Graduate Programs**

Radiological Technologies University provides an application through their website. Applications can also be provided via email or fax upon request.

- 1) After the application and all required materials are received, the applicant will be notified within 7-10 days. Required Materials include:
  - ✓ Letters of reference
  - ✓ Official transcripts from all higher education institutions
  - ✓ Personal statement letter
  - ✓ Copies of GRE if applicable to program
  - ✓ Copies of TOEFL or IELTS scores, if applicable
  - ✓ On line application
- 2) After the applicant is notified, an interview will be scheduled with the President or Vice President of Academic Affairs and Academic Dean via phone conference.
- 3) Course selection, registration, and financing will take place during advising and registration sessions.

### **Admission Requirements and Recommendations**

#### **GRADUATE PROGRAMS**

#### **Medical Physics, Medical Health Physics, and Nanomedicine Masters Programs**

#### **Application Requirements:**

- ✓ Letters of reference

- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of GRE if applicable to program
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and fee of \$35.00

### **Program Admission Requirements**

- ✓ Bachelor of Science Degree or equivalent
- ✓ A GPA of 2.5 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference

Admission requirements will be used to evaluate the acceptance of an applicant into the program.

### **Program Recommendations**

- ✓ Statistics (upper level)
- ✓ Human Anatomy and Physiology
- ✓ GRE test scores (advised but not required)
- ✓ Calculus – 2 semesters
- ✓ Minor in Physics( required for Medical Physics)
  - General Physics (calculus based) – 2 semesters
  - Modern Physics – 1 semester
  - Three additional upper level physics courses such as Quantum Mechanics, Electricity and Magnetism, Nuclear Physics, or Thermodynamics

\*Program recommendations are not a requirement for admissions and can be taken during the program.

### **Master of Medical Dosimetry Program**

#### **Program Application Requirements**

- ✓ Letters of references
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS, if applicable
- ✓ Online application and \$35.00 application fee

#### **Program Admission Requirements**

- ✓ Bachelor of Science Degree or equivalent
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language

(TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5

- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Three Letters of Reference

#### **Program Recommendations\***

- ✓ Human Anatomy and Physiology
- ✓ GRE is advised but not required

\*Program recommendations are not a requirement for admissions but must be taken prior to program completion.

#### **Grading System For Graduate level courses**

##### *Grade and Credit Point System*

The following grades are considered in computing semester or cumulative grade averages. Course hours with a grade of "F" are counted when computing grade point averages but do not count toward the earned hours required for degrees.

- A (4.0 Pts) Excellent
- B (3.0 Pts) Good
- C (0.0 Pts) Unsatisfactory
- D (0.0 Pts) Unsatisfactory
- F (0.0 Pts) Failing
- P (4.0 Pts) Passed (Pass/Fail Option)
- WF (0.0 Pts) Withdrawn – Failing

#### Repeated Courses

Repeated courses are counted in the Radiological Technologies University grade point average and may also be counted in the student's primary program GPA (Student Program GPA), depending on the policies of the student's program. Students must replace a failed grade, or a grade not meeting the minimum grade requirement. When students repeat a failed grade, the original grade will be replaced by the new grade and will be calculated in the cumulative GPA. Both grades are counted as attempted credits and calculated in SAP assessment.

The following grades are not considered in computing semester or cumulative grade point averages:

- AU Audit - No Credit
- I Incomplete/Pending
- T Denotes credits transferred from another Institution
- W Withdrawn

#### Abbreviations and Symbols

- EHRs Credit hours earned
- QPts Quality Points Earned
- GPA Grade point average (computed by dividing QPts by EHRs)

#### Credit Types

Regular Credit – All Radiological Technologies University credit is reported in terms of semester hours.

Graduate Students: A 3.0 cumulative GPA is required at all times.

Program requirements are part of the application process and must be completed prior to the start of the program. Recommendations are required in order to complete the program. They are not required prior to acceptance or program study.

### **Credit for Experiential Learning**

Radiological Technologies University does not grant any credit for prior experiential learning.

### **Transfer of Credit**

Radiological Technologies University may accept any course work successfully completed at other approved colleges and universities, if it comparably meets Radiological Technologies University course work requirements. A student may not transfer more than 25% of program classes. Classes must have a “C” or higher to be transferred. Graduate level class below a “B” are not eligible for transfer to an RTU graduate program. RTU reserves the right to refuse credit transfers.

Should a student wish to transfer credit from Radiological Technologies University to another college or university, the student is advised to first contact the academic institution to which the transfer of credit is sought. All colleges and universities have their own policy regarding acceptances of transfer of credit.

#### Process for transfer of credit

Students can find the transfer of credit form on-line or through administrative services. Students will need to provide RTU with a copy of the catalog description and support for evaluation. Once the student provides all needed documentation the University President or the Vice President of Academic Affairs and Academic Dean will review the request for approval. Administrative services will contact the student with the acceptance or rejection of the transfer. **Transfer credits are not included in the cumulative GPA or cumulative program GPA calculation.**

All students applying for the Master degree program must arrange to have original transcripts sent to Radiological Technologies University. These arrangements are to be made at the time of the student's application. Upon receipt of these transcripts of college level course/degree completions, the President or Vice President of Academic Affairs and Academic Dean will review the documents and make the assessment of the transferability of each course appearing on the transcripts. Students desiring to transfer credits must fill out a Transfer of credit request and provide the supporting documentation. The Vice President of Academic Affairs and Academic Dean will review the request and notify student of decision within 30 days. As part of that assessment, the Vice President of Academic Affairs and Academic Dean will assure that the student's GPA meets or exceeds the minimum required.

Should the transcripts be from overseas, those documents will be photocopied. The copies will be retained by this institution. The originals will be forwarded, by mail, to an independent Transcript Evaluation Service. Upon return of the documents, the President or Vice President of Academic Affairs and Academic Dean will review the correspondence received from the Transcript Evaluation Service and return all received documents to the student's official file. At that time, the Administrator will respond, in writing, to the applicant and document either: the acceptance of the credit or will document the specific courses which are transferable, which are not, and what further action will be

required of the student in order to meet the published academic entrance requirements for the selected degree program. Each document will be examined to assure that the work accepted is clearly indicated, by the issuing institution, to be degree appropriate coursework. Questions of the equivalency of credit from overseas institutions will be submitted to the Independent Transcript Evaluation Service. If evaluation is necessary by a third party the student will be responsible for payment of service.

## **ACADEMIC POLICIES**

### **Student Academic Progress**

Details regarding the academic progress of each student are documented by the institution. All students must maintain standards of satisfactory academic progress as measured by the student's cumulative grade point average. The minimum acceptable GPA (grade point average) is 3.0. Should an individual student's grade point average fall below 3.0, the student will be placed on academic probation. During the ensuing enrollment sessions the student will receive remedial guidance from the President, Program Director, or Vice President of Academic Affairs and Academic Dean, and additional assignments or projects may be required to assure that the student is benefiting from the instruction. The early identification of those students who are experiencing academic difficulty will assist the institution in providing the additional guidance that may provide a remedy. Students who do not meet minimum standards of satisfactory academic progress or demonstrate barriers to learning including social, emotional, and physical health deficits may be placed on Academic and/or Administrative Hold. This status is meant to work with the student and help them address their barriers to learning through time, counseling, or other means.

### **Standards of Satisfactory Academic Progress Policy and Procedures**

Radiological Technologies University has the following Standards of Satisfactory Academic Progress Policy for all students. These standards require that a student make progress toward an undergraduate or graduate degree during all periods of enrollment.

### **Minimum Standards of Satisfactory Academic Progress**

- ✓ Maintain required cumulative Grade Point Average(GPA) based on matrix below, or higher (a qualitative measure)

Graduate Students:

A minimum program GPA of 3.0 must be maintained at all times.

- ✓ Successfully complete at least 67% of the cumulative attempted credit hours(a quantitative measure) and
- ✓ Make positive progress toward a program of study within 150% of the published program length.

### **Statuses of Academic Progress**

- 1) Satisfactory – Student is meeting the minimum academic standards or has no academic history. Fully Eligible for financial assistance.

- 2) Warning – Student did not meet minimum standards for cumulative GPA and/or 67% completion rate in the previous evaluation period. Student must reach all minimum standards by the end of the next evaluation period. This is also referred to as academic probation.
- 3) Unsatisfactory Progress – Student has had two consecutive evaluation periods below minimum standards for cumulative GPA and/or 67% completion rate. Student is Ineligible for financial assistance, and may face academic probation or dismissal. Two consecutive periods below minimum will require a meeting with the Vice President of Academic Affairs and Academic Dean or other designated person with possible dismissal from the program.
- 4) Timeframe – Student has attempted at least 180 credit hours toward a Bachelor’s Degree. Graduate students must earn their degree within the timelines set by the Graduate School per their graduate program. If a student exceeds these credit hour limits, they are not making progress toward a degree within the 150% federal requirement.

When is Academic Progress Evaluated? A student’s standards of satisfactory academic progress will be evaluated at the end of each academic semester (i.e., fall, spring, and summer semesters).

Successful completion of an undergraduate class is defined as earning a grade of A, B, C, or Pass. Unsuccessful grades are D, F, W, Fail, or Incomplete.

Successful completion of a graduate class is defined as earning a grade of A, B, or Pass. Unsuccessful grades are C, D, F, W, Fail, or Incomplete.

Transfer Students and Transfer credit hours: Students transferring to RTU are required to have all prior college transcripts evaluated for transfer credits. All credit hours accepted by RTU will be used to determine 67% completion rate and maximum timeframe of 150%.

Remedial/Repeat Courses: All remedial and repeat courses will be used in determining completion rate and timeframe. Actual letter grades are not included in the cumulative GPA.

Audited Credit Hours: Courses taken on an audit basis are not counted when determining the completion percentage or for purposes of determining your cumulative GPA.

In order to calculate your total ATTEMPTED hours IF you have courses on your transcript with a grade of “W” (Withdrawal), “F” (Fail), “FA” (Failure to Attend) or “I” (Incomplete) you will need to account for those credits in your total attempted hours per federal regulation. A minimum of 3 (three) credit hours should be counted for EACH class that was withdrawn, failed, failure to attend, or incomplete and ADD the total number to “Total Earned Credits” on your transcript in order to determine total attempted hours.

For example, student has 2 grades of "W" (6 credit hours), 1 grade of "F" (3 credit hours), 3 grades of "I" (9 credit hours), and one grade of "I" (3 credit hours) and the bottom of the transcript shows "Total Earned Credits" of 80. To calculate total attempted credits, add  $(6+3+9+3)+80=101$  total attempted credit hours.

To calculate completion rate, take total EARNED credit hours and divide by total ATTEMPTED hours. For example:  $80/101=79\%$ .

"Cumulative GPA" (must meet SAP minimum GPA requirements).

If you are unable to determine your SAP status, visit or call Administrative services at 574-232-2408 for assistance.

### Resolving Incomplete Grades

The school incorporates an “I” for incomplete courses within the listed academic policies above. The School’s policy is that incomplete grades must be completed and a grade reported no more than five (5) semesters of active enrollment after the term the incomplete grade was earned. If the student does not resolve the incomplete grade, it becomes the responsibility of the School to assign a punitive grade of “F”.

### How to Re-establish Satisfactory Standing

A student must bring his/her GPA and completion rate up to the minimum standards of the required cumulative GPA, per matrix, and 67% completion rate.

### Appeal process for SAP

**Mitigating Circumstances:** If a student has experienced mitigating circumstances (illness, job related, family illness, change of major) during the most recent evaluation period, they may submit an Appeal. Appeal forms are available on the website. The student must also submit supporting documentation with the appeal form. If the request is granted, the student will be placed on one of two Statuses:

- 1) Probation – The student is expected to improve to minimum standards by the end of the next evaluation period. The student must meet minimum standards by the next evaluation period. A student cannot be on probation for two consecutive semesters.
- 2) Academic Success Plan – The student cannot be expected to improve to minimum standards by the next evaluation period. The student and RTU have agreed to a success plan to allow the student to meet minimum standards within a fixed number of evaluation periods. If at any time the student stops following the success plan and they are not meeting minimum standards they will become Ineligible for program completion. If a student meets minimum standards at any time while on a success plan their Status will be updated to Eligible.

If the request is not granted, the student will remain Ineligible until they meet all minimum standards.

**Timeframe Mitigating Circumstances:** If a student has not completed their program of study within the 150% timeframe and there are mitigating circumstances (illness, job related, family illness, change of major), they may submit an Appeal to be on a Not Enrolled; Pending status. If this application is granted, the student will be placed on the following Academic Eligibility Status:

**Timeframe Academic Success Plan –** The student and RTU have agreed to a success plan that they must follow. If at any time the student stops following the success plan, they may face dismissal from the program.

If the request is not granted, the student may be withdrawn from the program. All students are limited to one Timeframe Academic Success Plan.

Probation and dismissal actions are processed uniformly without regard to race, color, sex, religion, age, disability and national origin, as defined by law. In the event a student disagrees with the

application of these standards of satisfactory academic progress, a written appeal may be filed with the Vice President of Academic Affairs and Academic Dean.

## **NOTICE TO APPLICANTS**

### **Student Financial Assistance Programs Disclosure of Social Security Account Number**

Section 7(a) of the Privacy Act of 1974 (5U.S.C.552a) requires that when any federal, state, or local government agency requests an individual to disclose his or her Social Security Account Number, that individual must also be advised whether that disclosure is mandatory or voluntary, by what statutory or other authority the number is solicited, and what use will be made of it. Accordingly, applicants are advised that disclosure of the applicant's Social Security Account Number (SSAN) is required as a condition for participation in student financial assistance programs sponsored by the federal government, state, or the local government, in view of the practical administrative difficulties that would be encountered in maintaining adequate program records without the continued use of the SSAN. The SSAN will be used to verify the identity of the applicant and as an account number (identifier) throughout the life of the loan or other type of assistance in order to report necessary data accurately. As an identifier, the SSAN is used in such program activities as determining program eligibility, certifying school attendance and student status, determining eligibility for deferment or repayment of student loans, and for tracing and collecting in cases of defaulted loans. Authority for requiring the disclosure of an applicant's SSAN is grounded on Section 7(a)(2) of the Privacy Act, which provides that an agency may continue to require disclosure of an individual's SSAN as a condition for the granting of a right, benefit, or privilege provided by law where the agency required this disclosure under statute or regulation prior to Jan. 1, 1975, in order to verify the identity of an individual.

### **Program Completion**

The institution's policy on program completion is developed to ensure student progress through the program in a timely manner. Students must complete the program of study within 150% of the normal program length, as defined by the institution and must meet the program objectives. Students may be listed as Not Enrolled; pending by the President or Vice President of Academic Affairs and Academic Dean under the following conditions: student is awaiting accreditation, student has endured extraordinary personal hardship, or the student experiences delays from their clinical internship site that the student and University are unable to prevent. Students that have been granted this status are expected to maintain good communications with RTU. Program students will meet at least yearly with an RTU staff member/faculty member during boot camp to review their progress in the program. For students that require additional undergraduate courses for program completion, the program time will be adjusted based on number of credit hours needed.

### **Change of Program**

Students desiring to change programs of study must meet with the President or Vice President of Academic Affairs and Academic Dean to complete the appropriate documentation. The new program will have different Standards of Satisfactory Academic Progress and will be discussed during this meeting.

A maximum of three program changes may be made during a student's attendance at Radiological Technologies University-VT. Program completion time may be extended due to scheduling conflicts or the additional credit hours required for the new program. Students transferring to a new program will have applicable credit attempted and earned applied to the new program based on requirements of the new program.

## **Multiple Majors**

Students often decide to pursue more than one major because many courses are applicable to more than one program. Additional time is required to complete the required courses for a multiple major, and additional costs are incurred. Students wishing to take advantage of this opportunity must meet with the Program Director or Administrator to complete the appropriate forms. Students who choose to pursue multiple majors may utilize the courses requirements in one major to fulfill the elective requirements in another.

## **Counseling**

**Academic:** Students are encouraged to seek academic counsel from the faculty members, and Administrator - not only during registration periods but also during the academic year when problems and questions arise.

**Admissions:** Prospective students of the college are interviewed by an Admissions Representative to make sure their career objectives can be served by the college's academic resources. Those persons whose objectives cannot be served by the programs of the college are advised to seek other educational institutions that offer programs more aligned to their fields of interest.

**Employment:** RTU graduate placement support begins the first semester the student enters the program. Students are informed of opportunities in the industry during boot camp weeks and encouraged to be active with early networking. RTU meets with every student during boot camp weeks and discusses employment opportunities and placement opportunities. Students have access to faculty to assist with résumé writing, résumé reviews, rehearsing interviews, and coaching. RTU faculty are actively engaged with students and connecting them with opportunities through professional associations and relationships. RTU is evaluating other mechanisms to increase the student's exposure to employers. Graduate employment is very important to RTU.

**Financial Assistance:** Students may seek counseling from Administrative Services to manage financial arrangements.

**Personal:** Students and potential students are welcome and encouraged to seek assistance from any member of the staff or faculty regarding professional, personal, financial, and /or admissions counseling when issues arise that have a negative effect on their ability to do their best work at Radiological Technologies University. When appropriate, students are referred to outside agencies or professionals for support or assistance. Through our on line program student are given access to counseling services through [www.wellconnectbysrs.com](http://www.wellconnectbysrs.com). This website provides information, tools and support to address barriers to their success. Comprehensive student services are based on an individualized service. Students have access 24/7 to telephone counseling for students in crisis, assessment and students.

## **Student Resource Services**

All students also have access to the Student Resource Services (SRS) website ([www.wellconnectbysrs.com](http://www.wellconnectbysrs.com)) for information, tools, and support to address barriers to their success. Comprehensive student services are based on an individualized service plan and include:

- ✓ Unlimited 24-7 telephone counseling response to any covered students in crisis, assessment and students needing additional support or identifying new needs/requests;

- ✓ Telephone counseling/life coaching (1-5 telephone counseling hours) from a licensed mental health professional;
- ✓ Individualized resource searches for all covered students, focused on issues that impede student success, including special adjustment needs by specific populations such as returning veterans;
- ✓ Telephone consultations for all covered students with an attorney or financial expert;
- ✓ Follow-up and outreach with the student until all issues are resolved sufficiently that the student can be successful in personal and school goals;
- ✓ Staff/faculty formal referral of students with intensive needs;
- ✓ Faculty consultation on any student concerns that would impede that student from being successful.

### **Attendance**

This institution's policy on attendance is based on the premise that regular communication between the teacher and the student and, also, among students themselves, has significant value in the learning process. Our programs are structured to maximize your interaction with your instructor and peers while maintaining autonomy over your academic schedule. Therefore, each student is afforded the freedom to establish his or her schedule, but regular contact with the instructor/ teaching assistant and other enrolled students is a requirement that must be met. Such contact will help guide and maintain your steady progress towards the completion of assignments and courses. Such contact better assures we may more readily assist you in resolving any problematic aspects of your program. Instructors are authorized to factor the frequency and adequacy of your communications into the assignment of a grade for any given course.

Attendance at semester boot camp is mandatory for all program students. Students will be issued an incomplete if the student fails to attend boot camp.

### **Absences**

Allowances for interruptions in "attendance" due to illness or personal emergency should be handled on a case-by-case basis between the student and instructor. Arrangements to make up work missed and return to an agreed schedule should be initiated by the student and established with the instructor. Absences may be granted for good reasons at the discretion of the University. Students are required to submit a written request for any extended leave of absence.

Frequent absences during a course could be grounds for dismissal. Students will be contacted and counseled before significant measures are taken. Plans will be made for make-up work should it be warranted. RTU's course management system tracks the student's activities. This student activity log is used to verify class attendance.

### **Academic Integrity Policy**

RTU has a zero tolerance policy. Integrity is a foundational concept of professional behavior and RTU takes such matters very seriously. In general, if you have to ask if behavior would violate the integrity policy, it probably does.

RTU is committed to educate, implement, support, and enforce sound academic and professional integrity.

### Collaboration Defined

- ✓ Working together on assignments and projects
- ✓ Citing literature

### Cheating Defined

- ✓ Not doing the work
- ✓ Not doing the work and directly copying

If academic dishonesty is suspected, the information will be documented and brought before the President for review. The student or students will be notified that there is a suspicion of academic dishonesty and an investigation will follow. Information retrieved during the investigation process will be evaluated and the student or students involved will be informed of the result.

In the event that academic dishonesty is validated during the investigation process, the individual or individuals involved will be notified of any action RTU chooses to take.

Typically, a first offense will result in the individual or individuals receiving probationary status or dismissal.

### **Students with Disabilities**

If you feel you have a disability and need special accommodations of any nature whatsoever, please communicate them with the Director of Administrative Services before or during the first week of classes. The Director of Administrative Services will inform faculty as needed and the faculty member will make every effort to provide reasonable accommodations to ensure that you have a fair opportunity to perform in your course work.

### **Grievance Policy**

**First Step**-Anyone with a grievance or complaint may request an individual conference with the instructor or staff member to discuss the matter.

**Second Step**-If a satisfactory resolution to the problem is not reached, the aggrieved party should seek guidance from the Director.

**Third Step**-If the grievance is not resolved within 5 days of the incident, the aggrieved party must present to the Director, in writing, all facts of the grievance.

Within 48 hours, upon receipt of the written information, the Director will schedule a Grievance Committee hearing. The time of the meeting will be communicated in writing to all parties. The committee will consist of the Vice President of Academic Affairs and Academic Dean and two staff or faculty members not involved with the incident in question.

All Persons or their representatives involved with the incident must be present via teleconference at the time of the hearing. All parties involved will be given the opportunity to discuss the grievance. The Grievance Committee will excuse all parties involved in the grievance and immediately review and conclude the case. The decision of the committee will be communicated to those involved in the incident within 48 hours. The committee decision will be final.

The Accrediting Council for Independent Colleges and Schools (ACICS) provides complaint procedures for the filing of complaints against accredited institutions. ACICS requires that the complainant have exhausted all complaint and grievance procedures provided under the institutional policy. Should such a complaint be filed, ACICS will review the matter to determine whether there may have been any violation of its criteria and standards, and can take action only if it determines there to have been such a violation. ACICS can be contacted at 750 First Street, NE, Suite 980, Washington, DC 20002, (202) 336-6780.

### **Anti-Hazing Policy**

RTU is dedicated to promoting a safe and healthy campus environment for its students, faculty, staff and visitors. In addition, RTU is committed to promoting an environment that fosters respect for the dignity and rights of all its community members. As such, the University will not tolerate hazing activities by any individuals, groups, or recognized student organizations.

Hazing poses substantial risks to the safety and well-being of individual students and the University community. As such, violations of this policy will result in referral to the Office of Administration and possible disciplinary action which may include, but not be limited to, any or all of the following: suspension or expulsion from the University, loss of University recognition and privileges, referral to law enforcement, inability to participate in educational programs, and other educational or remedial action appropriate to the circumstances.

### **Pregnancy Policy**

Students should understand that a pregnancy during the Master of Medical Dosimetry program may have an impact on their education and possibly upon the timing of graduation. Two important factors are involved.

1. Courses are only offered at select times each year and time missed for pregnancy and/or delivery will likely necessitate make up work or perhaps delay of up to a year to maintain the proper sequence of courses, depending on the timing and amount of time missed.
2. There are potential risks to an embryo or fetus secondary to radiation exposure that may require counseling and alteration of the clinical education experience.

The following policy has been developed to guide the program and its students in the event of a student pregnancy.

- A. Female students are asked to read The U. S. Nuclear Regulatory Commission Regulatory Guide 8.13 regarding [“Possible Health Risks to Children of Women Who are Exposed to Radiation During Pregnancy”](#) as well as the pregnancy policy and complete and return the associated form. This document can be found at: <http://pbadupws.nrc.gov/docs/ML0037/ML003739505.pdf>.
- B. All students will be made aware of risks and hazards of prenatal radiation exposure during coursework at RTU and upon orientation to the clinical internship.
- C. A student who is pregnant, or suspects that she may be, has the option to voluntarily declare that condition to program officials.
  - a. If the student decides to declare the pregnancy it shall be done in writing to the Program Director and/or the Clinical Supervisor of her internship site. The notification shall also include the expected date of delivery.

- b. A student may reverse their pregnancy declaration at any time. This option is voluntary and the reversal must be provided in writing to the Program Director and/or the Clinical Supervisor of her internship site.
    - c. The program will comply with student confidentiality requests as much as possible.
  - D. If a student chooses to declare a pregnancy, a counseling session will be set up with the radiation safety officer at the student's clinical internship site to review radiation exposure risks and any additional monitoring practices which may be initiated.
  - E. A declared pregnant student may choose one of the options below (or may choose to change to a different option at a later time if desired, with written notice):
    - a. Take a leave of absence from the program. (See policy for leave of absence.) Should the declared pregnant student decide to leave the program during pregnancy and delivery, tuition will be refunded according to the Tuition Refund Policy. In this circumstance the student would be readmitted to the program at the first available opening after delivery.
    - b. Stay in the program, but make modifications in her clinical rotation schedules to reduce the chance of exposure to the fetus.
      - i. For example, she will not participate in site specific rotations as recommended by the Radiation Safety Officer during the time of the pregnancy. Competency and experience in all required areas will be made up following delivery. This could delay graduation beyond the originally expected date.
    - c. Stay in the program and/or internship during pregnancy and continue the program without modification of learning activities or clinical rotations. If she decides to do this, she does so in full knowledge of the potential hazard of embryo/fetal radiation exposure.
      - i. It is recommended that the student consult their personal physician should they choose this option. The student must also indicate, in writing her intention to continue the program without modification. A copy of this document will be kept in the student's file.

Should delivery occur during clinical internship, all course work and clinical time must be completed before the student is eligible for graduation.

**Student Radiation Safety Policy:**

- A. Students entering the clinical setting for their internship must receive orientation to radiation safety practices and requirements by the Radiation Safety Officer.
- B. A radiation monitoring badge must be worn by the student at all time while in the department.
- C. Students assisting in the simulator and treatment units must never be in the room during exposure to treatments
- D. Students working in brachytherapy must remember and put to use techniques of time, distance, and shielding.
- E. Radiation exposure levels will be monitored by the University RSO. If a student's radiation exposure reading exceeds 30 mrem on a single report, the program director must be informed immediately. The RSO and program director will investigate the reason for the reading and determine an action plan within 10 days to ensure that the student follows ALARA principles.
- F. If the student exceeds the trigger dose limit (30 mrem) on any personal monitoring report, the student must be removed from the clinical setting and counseled immediately by the university RSO, Program Director, and Clinical Coordinator on how to avoid further exposure.
- G. Notification: Dosimetry reports will be received by the Clinical Preceptor at the site. The Clinical Preceptor will provide the individualized dosimetry report to each student. No personal information will be visible to individuals other than the one named on the report. The

student will sign the dosimetry report and a copy will be sent to Radiological Technologies University.

### **Student Clinical Compensation and Hours Requirement Policy**

Students entering the clinical setting for their internship are only required to work twelve (12) hours per week and for no more than ten (10) hours per day.

Medical Physics Program: The minimum required hours for the Clinical Internship is one hundred eighty hours (180).

Medical Dosimetry Programs: The minimum required hours for the Clinical Internship is seven hundred twenty hours (720). For students who enrolled in their program of study prior to January 4, 2016, the minimum required hours for the Clinical Internship is one hundred eighty hours (180).

The student is entitled to no compensation while performing competencies for the clinical internship. Any extra hours the student chooses to spend are purely voluntary and the student is entitled to no compensation or extra credit of any kind.

### **Drug Free School and Workplace Policy**

#### A. Scope

This policy applies to all students, employees, and invitees on university premises or while conducting university business off university premises.

#### B. Policy Statement

4. The university absolutely prohibits the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance or alcohol on university premises or while conducting university business off university premises. Violation of this policy may result in immediate termination of employment.
5. In compliance with the Drug-Free Workplace Act of 1988 and the federal Drug-Free Schools and Communities Act Amendments of 1989, and as a condition of employment with Radiological Technologies University, all employees must:
  - a. Abide by the prohibition in point 1. (See above)
  - b. Notify the Director of Administrative Services for the campus of any conviction under a criminal drug statute for violations occurring on or off university premises while conducting university business, within 5 days of the conviction.
    - i. When the Director of Administrative Services receives notice of such a conviction, it will coordinate efforts to comply with the reporting requirements of the Drug-Free Workplace Act of 1988.
6. An employee who is (1) found to be under the influence of alcohol or a controlled substance while on university property, or in the course of a university activity, or (2) convicted of a criminal alcohol or drug statute violation occurring on university property, is subject to disciplinary action, up to and including termination.
  - a. An employee is determined to be under the influence according to the standard set by the applicable standard (e.g., Department of Transportation, Indiana law).
  - b. It is lawful for an individual to be under the influence of a controlled substance in a public place if the individual can present positive proof of the following:

- i. The individual is under the care of the Bureau of Addiction Services, a community mental health center, a managed care provider, or a licensed physician.
- ii. The controlled substance constitutes medical treatment authorized by state and federal law.

#### C. Reason for Policy

4. To promote a safe, healthy working environment for all employees
5. To provide assistance toward rehabilitation for any employee who seeks help in overcoming an addiction or dependence on alcohol or drugs
6. To reduce the incidence of injury to person or property and to reduce absenteeism, tardiness, and poor job performance

#### D. Procedures

3. When it is reasonably believed that an employee is under the influence of drugs or alcohol while on the job, contact the Director of Administrative Services to implement the following guidelines—all of which must be applied in accordance with the applicable Corrective Action policy.
  - a. The employee may be removed from the workplace until the employee is no longer under the influence and during the time an investigation is underway. In such circumstances, the supervisor will arrange to have the employee transported home.
  - b. The employee may be required to undergo drug or alcohol testing. This could occur both at the time the employee is suspected of being under the influence and/or before the employee is allowed to return to work as evidence the employee is no longer under the influence.
    - i. An employee's refusal to participate in requested drug and/or alcohol testing is a separate offense subject to corrective action.
  - c. An employee found to be under the influence is subject to discipline as provided in the Corrective Action policy.
  - d. The supervisor may counsel the employee to seek assistance.
  - e. Job performance problems are subject to the steps of the Corrective Action policy.
4. Assistance and rehabilitation
  - a. Employees requiring assistance in dealing with the use of alcohol or a controlled substance can receive such assistance in two ways: self-referral and university referral.
  - b. Employees are encouraged to seek confidential information and referral assistance from the following:
    - i. List of local social service agencies. Employees are advised to check with their medical plan administrator for coverage information.

#### E. Definitions

Controlled substances are those usually referred to as illegal drugs listed under the federal Controlled Substances Act.

#### G. Sanctions

3. All employees are reminded that conviction under state and federal laws that prohibit alcohol and drug-related conduct can result in fines, confiscation of automobiles and other property, and imprisonment. A conviction can also result in the loss of a license to drive or to practice in certain professions, and barred opportunities from employment.
4. A person who exhibits alcohol-related behavior such as the following is at risk of arrest:

- a. A person under 21 who possesses alcohol
- b. A person who provides alcohol to a person under 21
- c. A person who is intoxicated in public
- d. A person who sells alcohol beverages without a license

#### H. Related Information

3. All persons should be aware of the following health risks caused by alcohol:
  - a. Consumption of more than two average servings of alcohol in several hours can impair coordination and reasoning, and make driving an unsafe activity.
  - b. Consumption of alcohol by a pregnant woman can damage the unborn child. A pregnant woman should consult her physician about this risk.
  - c. Regular and heavy alcohol consumption can cause serious health problems such as damage to the liver and to the nervous and circulatory systems.
  - d. Drinking large amounts of alcohol in a short time may quickly produce unconsciousness, coma, and even death.
4. The health risks associated with controlled substances are numerous and varied depending on the drug. Nonetheless, the use of drugs not prescribed by a physician are harmful to the health. For example, drug use can cause the following conditions:
  - a. Impaired short-term memory or comprehension
  - b. Anxiety, delusions, and hallucinations
  - c. Loss of appetite resulting in damage to one's long-term health
  - d. A drug-dependent newborn, if the mother uses drugs during pregnancy
    - i. Pregnant women who use alcohol or drugs, or who smoke should consult their physician.
  - e. AIDS, as a result of drug users who share needles
  - f. Death from overdose

#### **Dismissal**

Radiological Technologies University reserves the right to dismiss any student from the program for any of the following reasons:

- ✓ Non-compliance of the rules and regulations of Radiological Technologies University
- ✓ Engagement in any illegal or criminal act
- ✓ Any conduct that brings discredit or embarrassment to Radiological Technologies University
- ✓ Failure to meet minimum standards of satisfactory academic progress
- ✓ Failure to meet ones financial obligations to Radiological Technologies University

#### **Student Records**

All documentation and records pertaining to students are held in strict confidence as afforded by law. It is also an ethical policy of the Radiological Technologies University to do so. Student records will be retained indefinitely by Radiological Technologies University. Information on students is not available to anyone without one of the following:

- ✓ Written request or release signed by the student

- ✓ A court order
- ✓ An oversight agency's requirement

### **Family Educational Rights and Privacy Act**

All students enrolled at Radiological Technologies University-VT shall have the right to inspect and review their educational records, to request corrections and deletions, and to limit disclosure with the Family Educational Rights and Privacy Act of 1974. The procedure for exercising these rights is available to students upon request at the office of the Executive Director.

Student records are kept on file in an appropriate and secure location. They are confidential and are available for approved purposes only by authorized employees. In accordance with the Family Educational Rights and Privacy Act of 1974, the college will not release educational records to unauthorized persons without the prior written consent of the student or parent/legal guardian if the student is less than 18 years of age.

The Family Educational Rights and Privacy Act of 1974 was designed to protect the privacy of educational records, establish the right of students to inspect and review their educational records, and provide guidelines for correction of inaccurate or misleading data through informal and formal hearings. Students also have the right to file complaints with the Family Educational Rights and Privacy Act (FERPA) Office concerning alleged failures by the school to comply with the Act.

NOTICE: Radiological Technologies University-VT will generally release certain directory information pertaining to its students to the public. This information may include student's name, address (es), phone number, program, dates of attendance, photographs, post- graduation employer and job title, participation in activities and recognition record, and the secondary and postsecondary educational institution attended by the student. If students prefer that any of this information may not be released by Radiological Technologies University-VT, they may make that request in writing, and Radiological Technology University – VT will honor it.

### **Drop/ Add Period**

Courses dropped during the first week of the semester will not appear on the student's transcript and students will not be charged tuition for those courses. Courses dropped during the second through seventh week of any semester will appear on the student's transcript with a grade of "W". Any course dropped after the seventh week of the semester will appear on the student's transcript with a grade of "WF". Tuition refunds will follow the stated refund policy of RTU.

Students may choose to add a subject to their schedule only during the first week of the semester. The addition of one or more courses may affect the tuition due.

### **Withdrawals**

We hope it will not be necessary for you to withdraw; but if circumstances cause you to consider doing so, please discuss any problems with us before making that decision. We are often able to provide assistance that enables students to remain in college.

If you must withdraw, an exit interview with the Administrator or Administrative services is required. During this meeting, you will discuss tuition due, refunds or outstanding debts. Students who withdraw from class will receive an appropriate grade as outlines in the section entitled Drop/Add Period. Upon returning, students will be required to repeat the class and will be responsible for any additional expenses.

## Transcripts

Upon written request by the student, Radiological Technologies University will prepare and forward a transcript of the student's record. All requests must include the student's full name, a statement requesting a transcript be issued, the address to which the student would like the transcript sent, and a release signature. Official transcripts will only be released if the student is in good standing with the academic office. Transcripts are sent free of charge within two weeks of the date the request was received.

## Tuition and Fees

Radiological Technologies University charges a fixed rate for each degree program. The program amount is based on the rate per credit. The cost of textbooks and study materials are not included in the tuition and outlined below.

Application Fee	\$35.00	(Non Refundable)
IT Service Fee	\$30.00	per semester
Library Fee	\$20.00	per semester
Textbooks	The student is responsible for securing all required textbooks unless otherwise stated	
Boot Camp weeks	The student is responsible for any travel, meals, and accommodation expenses that are incurred by attending boot camps.	
Auditing a course prior to completion for credit	\$1,100.00	

If a student wants to audit a course that they need to complete for credit at a later time, the flat rate for access is \$1,100.00 and the student has access to lectures and homework assignments only.

Students in the following programs are expected to maintain student memberships with the following organizations:

### Medical Physics Program

American Association of Physicists in Medicine \$69.00 per year (directly to AAPM)

### Medical Health Physics Program

Health Physics Society \$10.00 (directly to HPS)

## FINANCIAL POLICIES

The primary responsibility for financing a college education rests with the student. Students with unpaid balances may lose current enrollment and will not be allowed to register for any subsequent terms. Transcripts and diplomas are withheld from those who have not settled their financial obligations, which may include collection fees, attorney's fees, and court costs. Students are not fully registered, nor will they have the privilege of class attendance, participation in activities, or use of facilities until their charges are paid. A service charge of 1.5 percent, not to exceed \$45.00, may be added to any balance in the student account that is more than two (2) weeks past due.

Radiological Technologies University VT is not a participant in Federal or State financial aid programs.

### **Payment**

Students assume the responsibility for payment of the tuition costs in full, either through direct payment or through a financial assistance plan for those who qualify. All financial arrangements must be made before the beginning of classes. Full tuition or the first payment of a payment plan must be received no later than one week prior to the start of classes. The school will contact students who are delinquent in paying tuition and fees. They will then be counseled and encouraged to make specific arrangements with the school in order to remove their delinquency and remain in good financial standing. The school reserves the right to change tuition and fees, make curricular changes when necessary, and make substitutions in books and supplies as required without prior notice. Any changes in tuition or fees will not affect a student already in attendance or enrolled.

### **Tuition Payment Methods**

Radiological Technologies University accepts payment for tuition, course materials, equipment and other fees through cash payment, all major credit/debit cards, cashier's check, personal check, or company check. Upon availability, Radiological Technologies University will also assist students in applying for student financial assistance in order to defray the cost of their education. At the school's discretion, a payment plan may be arranged for those who qualify. Radiological Technologies University does not participate in government student aid programs. All outstanding student account balances are billed directly to the student upon graduation or termination. Failure to satisfy delinquent accounts within a reasonable time period will result in the account being submitted to a collection agency for processing and the student will not be allowed to graduate.

Payment Plans: Students are able to qualify for payment plans directly with RTU when the student is unable to qualify for student loans, or they qualify for student loans at an interest rate above 7%. Monthly payment amounts for payment plans are expected to be manageable for the student and allow for the shortest duration of payments to satisfy the financial obligation of their program. The minimum monthly payment amount is set at \$500, but some students may qualify for a lower monthly payment due to financial hardship.

### **Refunds**

The University shall pay a refund to the student in the amount calculated under the refund policy specified in this section. The University must make the proper refund no later than thirty-one (31) days of the student's request for cancellation or withdrawal.

The following refund policy applies:

- 1) A student is entitled to a full refund if one (1) or more of the following criteria are met:
  - A. The student cancels the enrollment agreement or enrollment application within six (6) business days after signing.
  - B. The student does not meet the postsecondary proprietary educational institution's minimum admission requirements.
  - C. The student's enrollment was procured as a result of a misrepresentation in the written materials utilized by the postsecondary proprietary educational institution.
  - D. If the student has not visited the postsecondary educational institution prior to enrollment and, upon touring the institution or attending the regularly scheduled orientation/classes, the student withdrew from the program within three (3) days.

- 2) A student withdrawing from an instructional program, after starting the instructional program at a postsecondary proprietary institution and attending one (1) week or less, is entitled to a refund of ninety percent (90%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 3) A student withdrawing from an instructional program, after attending more than one (1) week but equal to or less than twenty-five percent (25%) of the duration of the instructional program, is entitled to a refund of seventy-five percent (75%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 4) A student withdrawing from an instructional program, after attending more than twenty-five percent (25%) but equal to or less than fifty percent (50%) of the duration of the instructional program, is entitled to a refund of fifty percent (50%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 5) A student withdrawing from an instructional program, after attending more than fifty percent (50%) but equal to or less than sixty percent (60%) of the duration of the instructional program, is entitled to a refund of forty percent (40%) of the cost of the financial obligation, less an application/enrollment fee of ten percent (10%) of the total tuition, not to exceed one hundred dollars (\$100).
- 6) A student withdrawing from an institutional program, after attending more than sixty percent (60%) of the duration of the instructional program, is not entitled to a refund.

**Federal VA Policy:**

**Title 38 US Code CFR 21.4255 Refund Policy; Non-Accredited Courses for IHL/NCD**

A refund of the unused portion of the tuition, fees and other charges will be made to the veteran or eligible person who fails to enter or fails to complete the course as required by Veteran Administration regulation. The refund will be within 10% (percent) of an exact pro rata refund. No more than \$10.00 of the established registration fee will be retained if a veteran or eligible person fails to enter and complete the course.

The code states that the exact proration will be determined on the ratio of the number of days of instruction completed by the student to the total number of instructional days in the course.

This policy will change upon accreditation of the school by an accrediting body recognized by the U.S Department of Education. The State Approving Agency will be notified accordingly.

## **STUDENT SERVICES**

Faculty and staff work along with the individual student (as much as possible) to aid in making the duration of the program comfortable. All resources that are available to us are utilized to the fullest to assist the student in attaining his/her career goal.

### **Placement Services**

RTU is actively engaged with assisting students and graduates in finding employment. Both the RTU faculty and administrative staff engage with the students during boot camp weeks to prepare them for employment opportunities. One-on-one sessions help identify the student's interest for placement. The faculty is well-connected and able to assist the student with developing relationships. RTU does not guarantee employment after graduation.

### **Orientation**

A new student will receive online orientation including computer hardware and software requirements, resources available for successful completion of program requirements, as well as policies and procedures prior to the start of a program. Completion of administrative matters are also taken care of at this time. Each student will receive a written course outline no later than the first day of class.

### **Books and Supplies**

Course material and resources will be provided to the students online. Required textbooks are to be obtained by the student. Students will be informed of what materials are required and where they may purchase them.

### **Hours of Operation**

Administrative Offices	Monday – Friday	9:00 am – 5:00pm EST
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### **Contact Information**

100 E. Wayne Street, Suite 140  
South Bend, IN 46601  
Phone: 574.232.2408  
Toll Free 877.411.7238  
Fax: 574.232.2200

## **PROGRAM DESCRIPTIONS**

Course numbering system descriptions

MP	Medical Physics
MHP	Medical Health Physics
MD	Medical Dosimetry
NM	Nanomedicine
MATH	Mathematics

300-499	Bachelor level
500-699	Graduate level

## **GRADUATE LEVEL PROGRAMS**

### **Masters in Medical Physics**

The Medical Physicist's role is multi-faceted. The Medical Physicist works closely with Radiation Oncologists, Radiologists, Medical Dosimetrists, Radiation Therapists, X-ray Technicians, Nurses, and Regulators. The Medical Physicist works with radiation delivery devices, imaging devices, and the software associated with both of these units. Medical Physicists ensure that all radiation equipment is safe for patient use. The main objectives of this program are to provide education and clinical training for graduate students and to prepare them for careers in areas of diagnostic imaging, nuclear medicine, radiation therapy, and health physics.

#### **Program Goals and Objectives**

The Program goal for Master in Medical Physics:

Assist and direct students in the development of skills, competencies, and aptitude to enhance a career in Medical Physics

#### **Objectives**

- ✓ Prepare students to assume appropriate responsibilities in clinical practice of medical physics under the supervision of a certified medical physicist or to enter a medical physics residency program in Radiation oncology or diagnostic radiology.
- ✓ Prepare students with foundational knowledge for certification within the field of medical physics.
- ✓ Provide a foundation in which students can further their education, teach, pursue research in medical physics, and foster lifelong learning.

Evening courses, weekend courses, and remote learning processes will be offered to allow the working professionals the opportunity to succeed in furthering their professional development.

#### **Application Requirements:**

- ✓ Letters of reference
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of GRE if applicable to program
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and fee of \$35.00

#### **Program Admission Requirements**

- ✓ Bachelor of Science Degree or equivalent
- ✓ A GPA of 2.5 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS)

- minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Letters of References

Admission requirements will be used to evaluate the acceptance of an applicant into the program.

### **Program Recommendations**

- ✓ Statistics (upper level)
- ✓ Human Anatomy and Physiology
- ✓ GRE test scores (advised but not required)
- ✓ Calculus – 2 semesters
- ✓ Minor in Physics( required for Medical Physics)
- ✓ General Physics (calculus based) – 2 semesters
- ✓ Modern Physics – 1 semester
- ✓ Three additional upper level physics courses such as Quantum Mechanics, Electricity and Magnetism, Nuclear Physics, or Thermodynamics

Program recommendations are not a requirement for admissions and can be taken during the program.

### **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 3.0 or above on a 4.0 scale
- ✓ Earn a minimum of 49 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of “Pass”

### **Program Details**

Credit hours: 49

Duration: Two years

Tuition: \$50,000 (25,000 per year)  
 \$1020.41 per credit graduate level and program courses  
 \$416.67 per credit for undergraduate level course

### **Curriculum**

Core Courses (40 credits required)

MP501	Radiation Dosimetry	(4 credits)
MP502	Radiation Biology	(3 credits)
MP503	Physics of Diagnostic Radiology	(3 credits)
MP504	Physics of Nuclear Medicine	(3 credits)
MP505	Physics of Radiation Oncology I	(3 credits)
MP506	Physics of Radiation Oncology II	(3 credits)
MP508	Radiological Instrumentation	(2 credits)
MHP510	Health Physics and Radiation Safety	(3 credits)
MP520	Computer Systems in Medicine	(2 credits)
MP590	Medical and Professional Ethics	(1 credit)
MATH401	Mathematical Methods	(3 credits)
MATH402	Advanced Mathematical Methods	(2 credits)

MP599	Seminars*	(1 credit)
MP699	Clinical Internship	(4 credits)

\*Required each of the four semesters

#### Elective Courses (9 credits required)

MP611	Physics of Brachytherapy	(3 credits)
MP613	Physics of Nuclear Oncology	(3 credits)
MP615	Physics of Proton Therapy	(2 credits)
MD689	Medical Dosimetry Lab	(1 credit)
MP602	Advanced Radiation Biology	(2 credits)
MP603	Advanced Diagnostic Radiology	(2 credits)
MHP601	Shielding Design	(2 credits)
MP698	Independent Study in Medical Physics	(1-4 credits)

### Master of Medical Dosimetry

Radiation oncology is a health care discipline that uses ionizing radiation for the treatment of cancer and allied diseases. Radiation therapy, one of the three major modalities used in cancer management, is part of the treatment regimen for more than half of all cancer patients.

The Medical Dosimetrist is considered the leader of many Radiation Therapy Departments. The Medical Dosimetrist is actively engaged in patient imaging, simulation, and treatment planning. The Medical Dosimetrist works very closely with Physicians and Radiation Therapists. The plan that is generated will set the course of how the radiation is delivered. This plan could be the single most important component of a cancer patient's radiation therapy course.

### Mission Statement

The Master of Medical Dosimetry program is designed to prepare confident, patient focused, and clinically proficient medical dosimetrists that can offer support to the radiation therapy team and make a positive contribution to the healthcare field.

Goal: Students will be clinically proficient.

#### *Student Learning Outcomes:*

- ✓ Students will develop treatment plans that provide adequate target coverage while sparing normal and critical tissues.
- ✓ Students will demonstrate the ability to assist underclassmen in plan development and evaluation.
- ✓ Students will take an active role in their clinical rotations.

Goal: Students will demonstrate professional planning practices.

#### *Student Learning Outcomes:*

- ✓ Students will demonstrate knowledge of common toxicities by body site.
- ✓ Students will demonstrate a clear understanding of the effects of radiation on the human body.
- ✓ Students will evaluate plan parameters to ensure optimal patient care.

Goal: Students will develop effective communication and leadership skills.

#### *Student Learning Outcomes:*

- ✓ Students will demonstrate proficiency in oral communications through oral examinations and presentations.
  - ✓ Students will demonstrate proficiency in written communications through essays and research papers.
  - ✓ Students will demonstrate an understanding of radiation oncology department management.
- Goal: Students will demonstrate an understanding of the roles of the Radiation Therapist, Medical Dosimetrist, and Medical Physicist
- Student Learning Outcome:*
- ✓ Students will gain experience and knowledge through clinical interaction and discussions.
- Goal: Students will be team oriented and exemplify professionalism.
- Student Learning Outcomes:*
- ✓ Students will demonstrate the ability to work and communicate in a group setting.
  - ✓ Students will model professional and courteous behavior with faculty, staff, and peers.
- Goal: Students will exercise critical thinking and problem solving skills.
- Student Learning Outcomes:*
- ✓ Students will discuss and evaluate complex case studies related to the field.
  - ✓ Student will practice quality assurance by detecting and correcting plan errors.
  - ✓ Students will demonstrate knowledge of multiple treatment planning calculation algorithms and demonstrate proper application.

### **Program Requirements**

- ✓ Program Application Requirements
- ✓ Letters of references
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

### **Program Admission Requirements**

- ✓ Bachelor of Science Degree or equivalent
- ✓ A GPA of 2.0 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Letters of References

### **Program Recommendations**

- ✓ Human Anatomy and Physiology
- ✓ Completion of GRE (advised but not required)

Program recommendations are not a requirement for admissions but must be taken prior to program completion.

### **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 3.0 or above on a 4.0 scale
- ✓ Earn a minimum of 47 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of “Pass”

### **Clinical Obligations**

Some Clinics may require different student clinical obligations such as drug screening, immunization records, and background checks. Clinics that prefer to do their own testing and verification may do so directly with the student. RTU may be asked to perform these services and provide the results to the clinic upon their request.

Due to availability of clinical sites and student schedules, travel may be necessary in order to secure an appropriate clinical site. RTU resolves to make every effort to place student in a location that is within a reasonable distance from their place of residence.

Students may propose a clinical site closer to their place of residence than is currently available. In this instance, the University prefers to receive notice 5-6 months in advance for the purposes of communicating with the clinical site and securing paperwork. Students typically start their clinical internship hours during the second semester of their program. Students are expected to serve as a liaison between the University and the clinical setting.

Should a proposed site prove unsuitable, the student may propose another site or choose from sites currently available.

Evening/weekend clinical assignments are not required or encouraged. If measures must be taken in order to ensure adequate clinical time, proposals will be considered and must be agreeable to the student, University and clinical site.

### **Program Details**

Credit hours: 47

Program duration: Two years

Tuition:           \$35,000 (17,500 year)  
                          \$744.68 per credit graduate level/program courses  
                          \$416.67 per credit undergraduate level

### **Curriculum**

Core Courses (41 credits required)

MD502	Radiation Biology	(3 credits)
MD505	Radiation Oncology I	(3 credits)
MD506	Radiation Oncology II	(3 credits)
MP520	Computer Systems in Medicine	(2 credits)

MHP510	Health Physics and Radiation Safety	(3 credits)
MHP607	Radiation Oncology Department Management	(2 credits)
MHP609	Radiation Oncology Financials	(2 credits)
MP590	Medical and Professional Ethics	(1 credit)
MATH401	Mathematical Methods	(3 credits)
MP599	Seminars <sup>A</sup>	(1 credit)
MD588	Clinical Treatment Planning I	(2 credits)
MD590	Clinical Treatment Planning II	(3 credits)
MD688	Clinical Treatment Planning III	(3 credits)
MD690	Clinical Treatment Planning IV	(3 credits)
MD699	Clinical Internship	(4 credits)

Elective Courses (6 credits required)

MD501	Radiation Dosimetry	(4 credits)
MD611	Brachytherapy	(3 credits)
MD503	Diagnostic Radiology	(3 credits)
MD504	Nuclear Medicine	(3 credits)
MD613	Nuclear Oncology	(3 credits)
MD615	Proton Therapy	(2 credits)
MD698	Independent Study	(1-4 credits)
MD610	Education and Practicum I <sup>B</sup>	(2 credits)
MD611	Education and Practicum II <sup>B</sup>	(3 credits)
MD612	Education and Practicum III <sup>B</sup>	(3 credits)
MD613	Education and Practicum IV <sup>B</sup>	(3 credits)

<sup>A</sup>Required each of the four semesters

<sup>B</sup>Certified Medical Dosimetrists may take this course in lieu of the four Clinical Treatment Planning Courses (MD588, MD590, MD688, MD690)

**Sample Plan of Study**

Fall Year 1	
Clinical Treatment Planning I	2cr
Seminars	1cr
Diagnostic Radiology	3cr
Health Physics/Radiation Safety	3cr
Medical & Professional Ethics	1cr
	10cr

Spring Year 1	
Clinical Treatment Planning II	3cr
Seminars	1cr
Radiation Oncology I	3cr
Radiation Biology	3cr
Radiation Oncology Financials	2cr
	12cr

Summer Year 2	
Clinical Treatment Planning III	3cr
Seminars	1cr
Radiation Oncology II	3cr
Brachytherapy	3cr

Fall Year 2	
Clinical Treatment Planning IV	3cr
Seminars	1cr
Mathematical Methods	3cr
Radiation Oncology Dept. Mgmt.	2cr

Computer Systems in Medicine	2cr
	12cr

Clinical Internship	4cr
	13cr

### **The Joint Review Committee on Education in Radiologic Technology (JRCERT)**

Radiological Technologies University's BS Medical Dosimetry and MS Medical Dosimetry programs are accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT). All students are encouraged to review the JRCERT Standards for an accredited educational program in Medical Dosimetry located at [www.jrcert.org/programs-faculty/jrcert-standards/](http://www.jrcert.org/programs-faculty/jrcert-standards/).

#### **JRCERT**

20 N. Wacker Drive, Suite 2850

Chicago, IL 60606-3182

Phone: (312) 704-5300

Fax: (312) 704-5304

[www.jrcert.org](http://www.jrcert.org)

[mail@jrcert.org](mailto:mail@jrcert.org)

### **Masters in Medical Health Physics**

The Medical Physicist is responsible for radiation dose calculations and the administration of radiation dose to patients through their work with linear accelerators, sealed radiation sources, and computers.

The Medical Health Physicist is responsible for radiation safety aspects necessary to ensure the safe use of ionizing and non-ionizing radiation sources. Examples of Radioactive sources professionals may be handling or exposed to include radiation units and sources in radiation therapy, X-ray machines in diagnostic radiology, sealed and unsealed radioactive sources used in nuclear medicine and biomedical research, and lasers used in surgery and other areas of the hospital.

#### **Program Objectives**

- ✓ Provide the highest level of instruction both academically and clinically in the field of Medical Health Physics.
- ✓ Provide a comprehensive curriculum that is up to date in this rapidly progressing field of Medical Health Physics.
- ✓ Provide the highest level of clinical opportunities in the Medical Health Physics profession.
- ✓ Provide the tools necessary for the graduate to enter the workforce in the field of Medical Health Physics.
- ✓ Provide an active professional in a related field the opportunity to participate in the program through evening courses, weekend courses, and remote learning opportunities.
- ✓ The program structure, to ensure success of meeting the objectives, will include:
- ✓ A curriculum fostered after the Medical Physics Curriculum of the following institutions: University of Wisconsin and Purdue University
- ✓ Long term relationships with over 10 clinical institutions to ensure the student is actively engaged, supported, and a positive learning environment is created.
- ✓ An aggressive marketing campaign will focus on recruiting dedicated, hardworking students out of the science and engineering programs of the country's best institutions.
- ✓ Long term relationships with radiation therapy vendors to include: Varian Medical Systems, Siemens Medical Systems, Phillips, GE Medical Systems, Tomotherapy, Inc. and others to ensure an active engagement with the new technologies



MP502	Radiation Biology	(3 credits)
MP503	Physics of Diagnostic Radiology	(3 credits)
MP504	Physics of Nuclear Medicine	(3 credits)
MP505	Physics of Radiation Oncology I	(3 credits)
MP508	Radiological Instrumentation	(2 credits)
MHP510	Health Physics and Radiation Safety	(3 credits)
MHP601	Shielding Design	(2 credits)
MHP603	Non-Ionizing Radiation Safety	(2 credits)
MHP605	Regulations and Licensing	(2 credits)
MP520	Computer Systems in Medicine	(2 credits)
MP590	Medical and Professional Ethics	(1 credit)
MATH401	Mathematical Methods	(3 credits)
MATH402	Advanced Mathematical Methods	(2 credits)
MP599 S7	Seminars Session 7*	(1 credit)
MP599 S8	Seminars Session 8*	(1 credit)
MP599 S9	Seminars Session 9*	(1 credit)
MP599 S10	Seminars Session 10*	(1 credit)
MP699	Clinical Internship	(4 credits)

\*Four different 1-credit seminars sessions required

#### Elective Courses (9 credits required)

MP611	Physics of Brachytherapy	(3 credits)
MP613	Physics of Nuclear Oncology	(3 credits)
MP615	Physics of Proton Therapy	(2 credits)
MD689	Medical Dosimetry Lab	(1 credit)
MP602	Advanced Radiation Biology	(2 credits)
MHP602	Reactor Health Physics	(3 credits)
MHP606	Environmental Health Physics	(3 credits)
MP698	Independent Study	(1-4 credits)

#### Sample Plan of Study

Fall year 1	
Seminars Session 7 (MP599 S7)	1cr
Physics of Diagnostic Radiology (MP503)	3cr
Physics of Radiation Oncology I (MP505)	3cr
Health Physics/Radiation Safety (MHP510)	3cr
Medical and Professional Ethics (MP590)	1cr
	11cr

Spring year 1	
Seminars Session 8 (MP599 S8)	1cr
Computer Systems in Medicine (MP520)	2cr
Radiation Biology (MP502)	3cr
Physics of Nuclear Medicine (MP504)	3cr
Radiological Instrumentation (MP508)	2cr
Physics of Brachytherapy (MP611)	3cr
	14cr

Summer year 2	
Seminars Session 9 (MP599 S9)	1cr
Mathematical Methods (MATH401)	3cr
Radiation Dosimetry (MP501)	4cr
Reactor Health Physics (MHP602)	3cr
Non-ionizing Radiation Safety (MHP603)	2cr

Fall year 2	
Seminars Session 10 (MP599 S10)	1cr
Advanced Mathematical Methods (MATH402)	2cr
Shielding Design (MHP601)	2cr
Regulations and Licensing (MHP605)	2cr
Physics of Nuclear Oncology (MP613)	3cr

	13cr

Clinical Internship (MP699)	4cr
	14cr

## **Masters in Nanomedicine**

The application of science and technology at the nano-scale is revolutionizing medicine in the 21st Century – enabling us to understand many diseases leading to new insights in diagnostics and therapy and contributing to the development of new generations of medicinal products.

Developed in response to industry and society demand – the MS program in Nanomedicine at RTU is a national first that bridges the gap between nanotechnology and medicine, providing students with advanced knowledge, skills and practical experience of the principles, technology and applications within this exciting area. The main goal is to train the next generation of scientists and clinicians who will invent and use novel nanomedical products, expand the local talent pool for translation and commercialization, and bring relevant information to the public regarding new developments in nanomedicine.

### **Program Objectives**

- ✓ Provide the highest level of instruction both academically and clinically in the field of Nanomedicine.
- ✓ Provide a comprehensive curriculum that is up to date in this rapidly progressing field of Nanomedicine.
- ✓ Provide the highest level of clinical opportunities in the Nanomedicine profession.
- ✓ Provide the tools necessary for the graduate to enter the workforce in the field of Nanomedicine.
- ✓ Provide an active professional in a related field the opportunity to participate in the program through evening courses, weekend courses, and remote learning opportunities.
- ✓ The program structure, to ensure success of meeting the objectives, will include:
  - ✓ Students will build a solid foundation in medical physics concepts that will set the foundation for continuing to a master's degree in Medical Physics.
  - ✓ Students will master core concepts of nanotechnology in medicine. Students will begin with foundational nanotechnology concepts and build throughout course work to a final understanding of the nanomedicine and medical physics delivery systems.
  - ✓ Student will evaluate and or participate with current research in nanomedicine and learn to merge the concepts of Medical Physics that assist in safe delivery systems to patient populations.

### **Program Application Requirements**

- ✓ Letters of references
- ✓ Official transcripts from all higher education institutions
- ✓ Personal statement letter
- ✓ Copies of TOEFL or IELTS scores, if applicable
- ✓ On line application and \$35.00 application fee

### **Program Admission Requirements**

- ✓ Bachelor of Science Degree or equivalent
- ✓ A GPA of 2.5 (on a 4.0 scale) for the last degree earned. A 3.0 or higher (on a 4.0 scale) is preferred.
- ✓ If applicant's first language, or language of instruction, is not English, English proficiency examination scores are required. Test of English as a Foreign Language (TOEFL) minimum scores are 650 (paper-based) or 219 (computer-based) or 79 (internet-based). The International English Language Testing System (IELTS) minimum score required is 6.5
- ✓ Interview with RTU representative
- ✓ Personal statement
- ✓ Letters of References

### **Recommendations/Prerequisites required for program completion**

- ✓ Anatomy and Physiology
- ✓ Calculus I & II
- ✓ Statistics
- ✓ Completion of GRE

Program recommendations are not a requirement for admissions but must be taken prior to program completion.

### **Program Graduation Requirements**

- ✓ Earn a cumulative program GPA of 3.0 or above on a 4.0 scale
- ✓ Earn a minimum of 41 program credits including earning credit for all courses listed as core courses
- ✓ Meet all published paperwork and competency requirements for the clinical internship, yielding a grade of "Pass"

### **Program details**

Credit hours: 41

Program duration: Two years

Tuition: \$41,836.81 (\$20,918 per year)  
\$1020.41 per credit graduate level/program courses  
\$416.67 per credit for undergraduate course

### **Curriculum**

Core Courses (37 credits required)

MP501	Radiation Dosimetry	(4 credits)
MP502	Radiation Biology	(3 credits)
MP503	Diagnostic Radiology	(3 credits)
MP505	Radiation Oncology I	(3 credits)
MP508	Radiological Instrumentation	(2 credits)
MP603	Advanced Diagnostic Radiology	(2 credits)
NM540	Nanotechnology I	(3 credits)
NM541	Nanotechnology II	(3 credits)
NM550	Nanomedicine I	(4 credits)
NM551	Nanomedicine II	(4 credits)

NM598	Nanomedicine Seminar I	(1 credit)
NM599	Nanomedicine Seminar II	(1 credit)
NM699	Clinical Internship	(4 credits)

Elective Courses (4 credits required)

MHP510	Health Physics & Radiation Safety	(3 credits)
MP506	Physics of Radiation Oncology II	(3 credits)
MP613	Physics of Nuclear Oncology	(3 credits)
MP602	Advanced Radiation Biology	(2 credits)
MP611	Physics of Brachytherapy	(3 credits)
MP615	Physics of Proton Therapy	(2 credits)
MHP601	Shielding Design	(2 credits)
MD689	Medical Dosimetry Lab	(1 credit)
MP698	Independent Study in Medical Physics	(1-4 credits)
NM560	Research/Design Sequence in Cancer Nanomedicine	(2 credits)

**Sample Plan of Study**

Fall Year 1	
Radiation Oncology I	3cr
Health Physics/Radiation Safety	3cr
Diagnostic Radiology	3cr
Nanotechnology I	3cr
	12cr

Spring Year 1	
Radiation Biology	3cr
Radiological Instrumentation	2cr
Nanomedicine I	4cr
Nanomedicine Seminar I	1cr
	10cr

Summer Year 2	
Radiation Dosimetry	4cr
Nanotechnology II	3cr
Clinical Internship	4cr
	11cr

Fall Year 2	
Advanced Radiation Biology	2cr
Advanced Diagnostic Radiology	2cr
Nanomedicine II	4cr
Nanomedicine Seminar II	1cr
	9cr

## UNIVERSITY STRUCTURE

Radiological Technologies University  
100 E. Wayne Street, Suite 140  
South Bend, IN 46601  
Phone: 574-232-2408  
Fax: 574-232-2200  
Website: [www.rtuvt.edu](http://www.rtuvt.edu)

### Board of Directors

Brent D. Murphy, MS, MBA, DABR	Founder and Chairman, President
Renat Letfullin, Ph.D.	Member
Scott Dube, MS, DABR	Member
Andy Downing	Member
Greg Hiatt, RPH	Member

### Advisory Board: Medical Physics, Medical Health Physics, Nanomedicine

Brent D. Murphy, MS, MBA, DABR	Founder and Chairman, President
Renat Letfullin, Ph.D.	Member
Scott Dube, MS, DABR	Member
Manuel Arreola, Ph.D., DABR	Member
Steve Goetsch, Ph.D., DABMP	Member

### Advisory Board: Medical Dosimetry, Radiation Therapy

Brent D. Murphy, MS, MBA, DABR	Founder and Chairman, President
Scott Dube, MS, DABR	Member
Mellonie Brown-Zacarias, M.E.T., CMD, R.T.(T.)	Member
Carol Scherbak, M.S.R.S., R.T.(T.)	Member

### Program Leadership

Scott Dube, MS, DABR	Medical Physics Program Director
Manuel Arreola, Ph.D., DABR	Medical Physics Imaging Program Director
Renat Letfullin, Ph.D.	Nanomedicine Program Director
Mellonie Brown, M.E.T., CMD, R.T.(T.)	Medical Dosimetry Program Director
	Radiation Therapy Program Director
	Medical Imaging Program Director

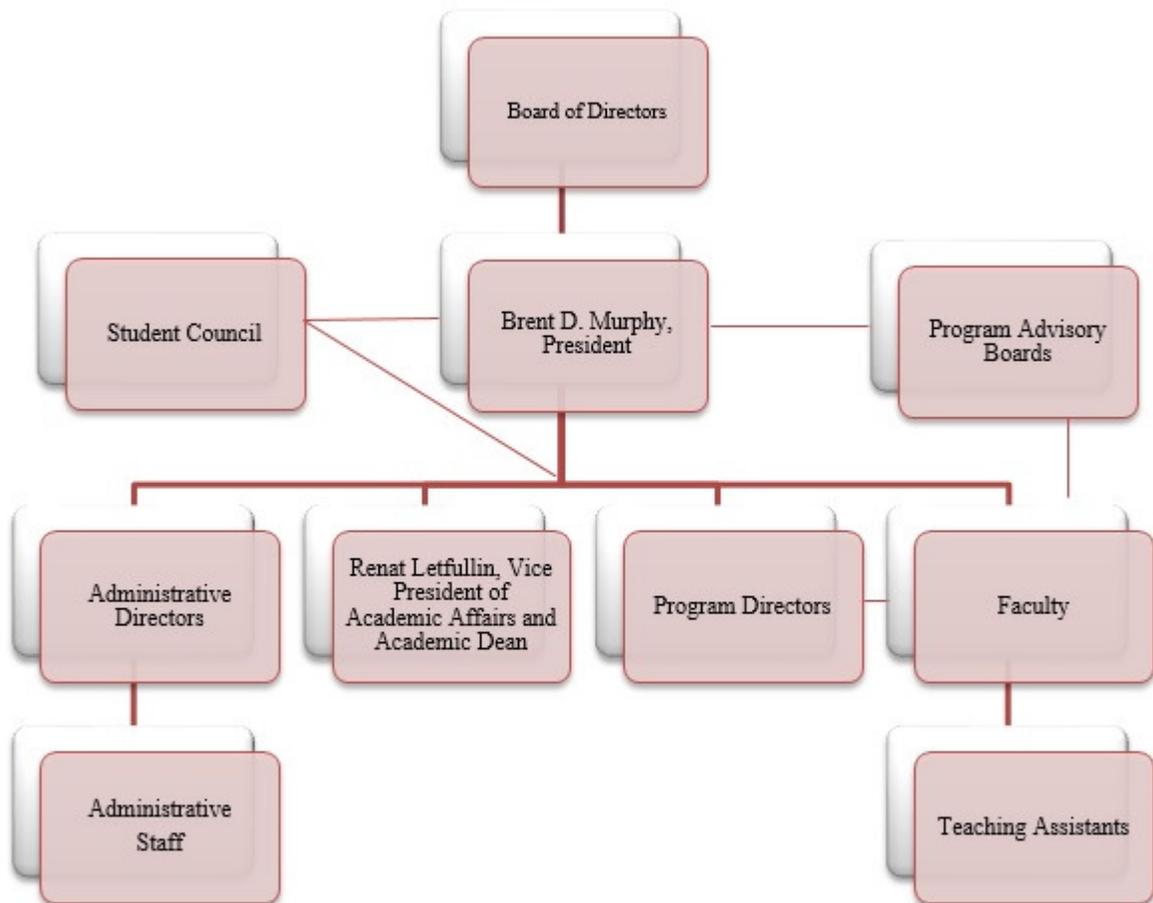
### Administrative Control

Brent D. Murphy, MS, DABR	President
Renat Letfullin Ph.D.	Vice President of Academic Affairs and Academic Dean
Elizabeth Datema, BS	Director of Administrative Services

### Staff Listing

Brent Murphy, MS, DABR	President
Elizabeth Datema, BS	Director of Administrative Services
Linda Murphy, BS	Director of Recruitment
Kuralay Kussainova, MS	Recruiter, Marketing Assistant, International Relations
Barbara Wallace, MLS	Librarian
Debra Merley	Administrative Assistant

# Radiological Technologies University Organizational Chart



# RTU-VT COURSE CATALOG

## PROGRAM DESCRIPTIONS

### Course numbering system descriptions

MD	Medical Dosimetry
MP	Medical Physics
MHP	Medical Health Physics
NM	Nanomedicine
MATH	Mathematics

300-499	Bachelor level
500-699	Graduate level

### Credit hour definition

One semester credit hour equals, at a minimum, 15 classroom hours of lecture and 30 hours of laboratory or 45 hours of practicum. The formula for calculating the number of semester credit hours for each course is:  $(\text{hours of lecture}/15) + (\text{hours of lab}/30) + (\text{hours of practicum}/45)$ .

## GRADUATE LEVEL COURSES DESCRIPTIONS

### Core and Elective Courses

#### MATH401 MATHEMATICAL METHODS 3 CREDITS

This course focuses on the fundamentals of statistical analysis for science. Emphasis is placed on statistic nomenclature, probability evaluation, hypothesis testing and evaluation, experimental design, regression models, and variable/data analysis.

#### MATH402 ADVANCED MATHEMATICAL METHODS 2 CREDITS

This course focuses advanced statistical analysis. Emphasis is placed on Multiple Data Comparisons, Clinical Regression Models, Time Series Analysis, Forecasting, Survival Analysis, Clinical Study Design, and Statistical Quality Control.

Prerequisite: Math 401

#### MP501/MD501 RADIATION DOSIMETRY 4 CREDITS

This course focuses on introducing radiation terminology used in radiation dosimetry. Fundamental dose calculation theories are reviewed and an emphasis is placed on clinical and radiation safety related dosimetry techniques.

Recommended: Calculus I and Calculus II

MP502/MD502

**RADIATION BIOLOGY**

**3 CREDITS**

This course focuses on introducing fundamental radiation biology concepts. Emphasis is placed on radiation interactions, cell damage, cell survival curves, cell sensitivity and response, factors affecting cell response, tissue kinetics, effects on the fetus, biological models, and radiobiological risk assessment.

MP503 / MD503

**PHYSICS OF DIAGNOSTIC RADIOLOGY / DIAGNOSTIC RADIOLOGY**

**3 CREDITS**

This course focuses on introducing fundamental physics in the medical imaging profession. Fundamental concepts are applied to the system design of each imaging component presented. A special emphasis is placed on the implementation and application of each diagnostic imaging modality.

MP504 / MD504

**PHYSICS OF NUCLEAR MEDICINE / NUCLEAR MEDICINE**

**3 CREDITS**

This course focuses on introducing physical principles of radioisotopes and imaging systems used in medicine and biology. Imaging systems are discussed at length with a focus on applying universal imaging concepts such as contrast and resolution to the Anger camera, PET and SPECT scanners. Radiochemical therapy and other radiopharmaceuticals are discussed. Health physics and quality control issues pertinent to nuclear medicine physics are addressed.

MP505 / MD505

**PHYSICS OF RADIATION ONCOLOGY I / RADIATION ONCOLOGY I**

**3 CREDITS**

This course focuses on applying the fundamental radiation oncology physics concepts to specialty procedures. Emphasis is placed on: Advanced electron beam therapy, electron arc therapy, electron IORT, stereotactic radiosurgery, IMRT, IGRT, IMET, Robotic therapy, Tomotherapy, physics measurement for specialty procedures using different phantoms, and comprehensive quality assurance.

MP506 / MD506

**PHYSICS OF RADIATION ONCOLOGY II / RADIATION ONCOLOGY II**

**3 CREDITS**

This course builds upon the fundamental ideas developed in Radiation Oncology I. A wide range of specialized topics are covered. The intent is to familiarize the student with a broad swath of special procedures encountered in radiation oncology, and to provide in-depth understanding of the most common of these special procedures. The course also covers the process of machine acceptance and commissioning, the use of this data by the operator of the treatment planning system, and how the system then uses that data to calculate doses from therapy devices. Emphasis throughout this course is placed on quality control and quality assurance.

Prerequisite: Radiation Oncology I MP505 or MD505

MP508  
RADIOLOGICAL INSTRUMENTATION  
2 CREDITS

This course focuses on introducing fundamental radiation measuring devices and instrumentation. Emphasis is placed on clinical use of the instrumentation in the Radiological Fields.

MP520  
COMPUTER SYSTEMS IN MEDICINE  
2 CREDITS

This course serves as a fundamental introduction to software, hardware, networks, and installation design for computers used in medical applications. Computer Systems in the following radiological disciplines will be presented: Diagnostic Radiology, Nuclear Medicine, Radiation Oncology, and PACs.

MP590  
MEDICAL AND PROFESSIONAL ETHICS  
1 CREDIT

This course focuses areas that require an understanding of medical ethics. Emphasis will be placed on Patient Data, Patient Records, Publications, Presentations, General Professional Conduct, Medical Malpractice, and Research.

MP599  
SEMINARS  
1 CREDIT

Two series of seminars are run concurrently. The “informational seminar” series provides the student with updates regarding new and emerging technologies and research in the relevant disciplines. The student will write a number of white papers on the subjects of these seminars. Concurrently, a “didactic seminar” series is provided with diverse “mini-lab” assignments.

MP602  
ADVANCED RADIATION BIOLOGY  
2 CREDITS

This course focuses on introducing advanced radiobiological concepts and practices. Emphasis is placed on tumor kinetics, radiation biology models, experimental set-up, and radiobiological treatment planning.

Prerequisite: Radiation Biology MP502 or MD502

MP603  
ADVANCED DIAGNOSTIC RADIOLOGY  
2 CREDITS

This course focuses on introducing advanced principles in the medical imaging sciences. Emphasis is placed on mathematical methods used for image creation and evaluation, ultrasound imaging, advanced CT imaging, and MRI imaging.

Prerequisite: Diagnostic Radiology MP503

MP611 / MD611

PHYSICS OF BRACHYTHERAPY / BRACHYTHERAPY

3 CREDITS

This course focuses on introducing fundamental radiation physics and safety of Brachytherapy. Special emphasis is placed on both LDR and HDR Brachytherapy.

MP613 / MD613

PHYSICS OF NUCLEAR ONCOLOGY / NUCLEAR ONCOLOGY

3 CREDITS

This course introduces the new emerging field of Nuclear Oncology. Topics covered include: liver microsphere treatment imaging and treatment, I-131 thyroid ablation, and high dose I-131 thyroid ablation, Sr-89 treatment, and new experimental isotopes.

MP615 / MD615

PHYSICS OF PROTON THERAPY / PROTON THERAPY

2 CREDITS

This course gives the student a background in the fundamental science underlying proton and heavy ion therapy. The radiological physics of these particles is treated first to give the student background necessary for the remainder of the course. The remainder of the course emphasizes the unique challenges faced and opportunities made possible in the use of these types of treatments; these points are presented in contrast with standard x-ray and electron therapy.

MD588

CLINICAL TREATMENT PLANNING I

2 CREDITS

The ability to create a workable treatment plan is the fundamental responsibility of the medical dosimetrist, and is a skill that a medical physicist must keep well in practice. This course focuses on applying the fundamental treatment planning concepts to include an anatomical, molecular imaging and biological overview. An emphasis is placed on developing basic physics and dosimetry quantities, CT anatomy delineation, immobilization, simulation, treatment computer planning algorithms including calculations, commissioning and quality assurance.

Certified Medical Dosimetrists may take Education and Practicum I (MD610) in lieu of this course.

MD590

CLINICAL TREATMENT PLANNING II

3 CREDITS

This course focuses on applying the fundamentals of 2D-3D treatment planning concepts to include an anatomical and biological overview of multiple cancer types. An emphasis is placed on understanding basic site specific radiation treatment planning techniques and different cancer treatment options. Site specific cancer overview may include epidemiological statistics, anatomy, pathology, clinical presentation, routes of spread, diagnostic studies, staging, prognostic factors, and treatment toxicity. CT anatomy and multiple imaging modalities will accompany treatment planning lab exercises.

Prerequisite: Clinical Treatment Planning I (MD588)

Certified Medical Dosimetrists may take Education and Practicum II (MD611) in lieu of this course.

MD688

### CLINICAL TREATMENT PLANNING III

3 CREDITS

This course focuses on applying the fundamentals of 3D and IMRT treatment planning concepts to include image guidance with an anatomical and biological overview of multiple cancer types. An emphasis is placed on understanding basic site specific radiation treatment planning techniques and different cancer treatment options. Site specific cancer overview may include epidemiological statistics, anatomy, pathology, clinical presentation, routes of spread, diagnostic studies, staging, prognostic factors, and treatment toxicity. Special procedures including Stereotactic Radiosurgery (STS), Stereotactic Body Radiation (SBRT) and Hyperthermia will be discussed in relation to planning and treatment delivery. Specialized radiation therapy equipment (Tomotherapy, Gamma Knife and CyberKnife) used to deliver special procedures will be evaluated and compared to traditional linear accelerator treatments. CT anatomy and multiple imaging modalities will accompany treatment planning lab exercises.

Prerequisite: Clinical Treatment Planning II (MD590)

Certified Medical Dosimetrists may take Education and Practicum III (MD612) in lieu of this course.

MD690

### CLINICAL TREATMENT PLANNING IV

3 CREDITS

This course focuses on applying the fundamentals of IMRT, VMAT, and Brachytherapy treatment planning concepts to include an anatomical and biological overview of multiple cancer types. An emphasis is placed on understanding advanced radiation treatment planning techniques and comparison between static and volumetric intensity modulated treatment plans. Additional emphasis will be given to HDR/LDR brachytherapy treatment planning. Site specific cancer overview may include epidemiological statistics, anatomy, pathology, clinical presentation, routes of spread, diagnostic studies, staging, prognostic factors, and treatment toxicity. Special procedures including Proton Therapy, Heavy Charged Particle Therapy and Radioisotope Therapy will be discussed in relation to general theory, planning techniques and treatment delivery. CT anatomy and multiple imaging modalities will accompany treatment planning lab exercises.

Prerequisite: Clinical Treatment Planning III (MD688)

Certified Medical Dosimetrists may take Education and Practicum IV (MD613) in lieu of this course.

MD610

### EDUCATION AND PRACTICUM I

2 CREDITS

Education and Practicum I is offered to those students who have passed the Certified Medical Dosimetrist (CMD) board exam given by the Medical Dosimetry Certification Board (MDCB). This class will offer alternative assignments dealing with current and experimental special radiation therapy procedures such as: Cyberknife, Tomotherapy, Particle Therapy, Stereotactic Radiosurgery, and Brachytherapy. This course will provide an introduction to clinical research. Students are expected to prepare clinical or research presentations. The student will present projects to faculty and peers during university meetings. Students are also encouraged to present their clinical research during local, regional, or national professional society meetings. In addition, students will gain experience in dosimetry planning lab instruction and leadership development skills. These classes will progress in increasing complexity from I-IV.

Prerequisite: Anatomy 1 semester

## MD611

### EDUCATION AND PRACTICUM II

#### 3 CREDITS

Education and Practicum II is offered to those students who have passed the Certified Medical Dosimetrist (CMD) board exam given by the Medical Dosimetry Certification Board (MDCB). This course follows in sequence the Education and Practicum I course and expands on leadership and lab instruction. This class will offer alternative assignments dealing with current and experimental special radiation therapy procedures such as: Cyberknife, Tomotherapy, Particle Therapy, Stereotactic Radiosurgery, and Brachytherapy. This course will provide an introduction to clinical research. Students are expected to prepare clinical or research presentations. The student will present projects to faculty and peers during university meetings. Students are also encouraged to present their clinical research during local, regional, and national professional society meetings. These classes will progress in increasing complexity from I-IV.

Prerequisite: Education and Practicum I (MD610)

## MD612

### EDUCATION AND PRACTICUM III

#### 3 CREDITS

Education and Practicum III is offered to those students who have passed the Certified Medical Dosimetrist (CMD) board exam given by the Medical Dosimetry Certification Board (MDCB). This course follows in sequence the Education and Practicum II course and expands on clinical case studies and presentation skills. This class will offer alternative assignments dealing with current and experimental special radiation therapy procedures such as: Cyberknife, Tomotherapy, Particle therapy, Stereotactic Radiosurgery, and Brachytherapy. This course will provide an introduction to clinical research. Students are expected to prepare clinical or research presentations. The student will present projects to faculty and peers during university meetings. Students are also encouraged to present their clinical research during local, regional, and national professional society meetings. In addition, students will gain experience in dosimetry planning lab instruction and leadership skills. These classes will progress in increasing complexity from I-IV.

Prerequisite: Education and Practicum II (MD611)

## MD613

### EDUCATION AND PRACTICUM IV

#### 3 CREDITS

Education and Practicum IV is offered to those students who have passed the Certified Medical Dosimetrist (CMD) board exam given by the Medical Dosimetry Certification Board (MDCB). This course follows in sequence the Education and Practicum III course and expands on clinical case study presentations and lab instruction. This class will offer alternative assignments dealing with current and experimental special radiation therapy procedures such as: Cyberknife, Tomotherapy, Particle Therapy, Stereotactic Radiosurgery, and Brachytherapy. This course will provide an introduction to clinical research. Students are expected to prepare clinical or research presentations. The student will present projects to faculty and peers during university meetings. Students are also encouraged to present their clinical research during local, regional, and national professional society meetings. Students will gain experience in dosimetry planning lab instruction and leadership skills. These classes will progress in increasing complexity from I-IV.

Prerequisite: Education and Practicum III (MD612)

MP698 / MD698

INDEPENDENT STUDY IN MEDICAL PHYSICS / INDEPENDENT STUDY

1-4 CREDITS

Independent study courses are generally designed to allow a student to pursue one of their academic or research interests outside of the standard curriculum offered by the school. You will arrange with your selected instructor a schedule, goals, and assessment milestones.

MP699 / MD699

CLINICAL INTERNSHIP

4 CREDITS

The student participates in a competency-based clinical internship. The internship is designed to give the student laboratory/clinical instruction in specific areas of medical physics or dosimetry practice. The student keeps a daily journal of their progress on each of the course competencies, to include not only assigned calculations and discussions but also relevant notes and observations on clinical practice.

MHP510

HEALTH PHYSICS AND RADIATION SAFETY

3 CREDITS

This course focuses on introducing physical principles of radioisotopes and imaging systems used in medicine and biology. Imaging systems are discussed at length with a focus on applying universal imaging concepts such as contrast and resolution to the Anger camera, PET and SPECT scanners. Radiochemical therapy and other radiopharmaceuticals are discussed. Health physics and quality control issues pertinent to nuclear medicine physics are addressed.

MHP601

SHEILDING DESIGN

2 CREDITS

This course focuses on technical aspects of Radiation Shielding fundamentals. Emphasis is placed on facility shielding for radiation devices to include: x-ray units, CT units, HDR Brachytherapy units, and therapy treatment units.

MHP602

REACTOR HEALTH PHYSICS

3 CREDITS

This course focuses on technical aspects of reactor health physics. Emphasis is placed on reactor operation, reactor waste, reactor processes, and establishment of the Health Physics Program.

MHP603

NON-IONIZING RADIATION SAFETY

2 CREDITS

This course focuses on introducing fundamental concepts and safety with non-ionizing radiation sources. Emphasis is placed on laser operation and safety, ultrasound operation and safety, MRI operation and safety, safety program development, and other non-ionizing devices.

MHP605  
REGULATIONS AND LICENSING  
2 CREDITS

This course focuses on the regulatory agencies, the respective regulations, and licensing of radiation devices. Emphasis is placed on learning the working regulations of the NRC, EPA, DOT, and other respective guidelines.

MHP606  
ENVIRONMENTAL HEALTH PHYSICS  
3 CREDITS

This course focuses on technical aspects of environmental health physics. Emphasis is placed on radon evaluation, environmental monitoring and techniques, dose assessment from water, air, gas, and food, dose and risk assessment.

MHP607  
RADIATION ONCOLOGY DEPARTMENT MANAGEMENT  
2 CREDITS

This course focuses on management techniques for medical professionals in the radiation oncology field. Emphasis is placed general management techniques and managing radiation oncology professionals. Implementation of a New Cancer Center is also discussed.

MHP609  
RADIATION ONCOLOGY FINANCIALS  
2 CREDITS

This course focuses on the financial aspects of a Radiation Oncology Department. Emphasis is placed and technical and professional billing, budget development, contract evaluation, and program start-up cost.

NM540  
NANOTECHNOLOGY I  
3 CREDITS

This course will be designed to provide a comprehensive understanding of the technologies used for structuring matter at the nanometer scale (approximately 100 nm and below). Different approaches for creating nanostructures and Nano devices will be covered, with a discussion of the capabilities and limits of each. Students will learn the fundamental physics, chemistry, and material science of nanofabrication, as well as the practical aspects of the creative process of building functional structures at the Nano scale.

Prerequisite: Upper division or graduate standing in area of science

NM550  
NANOMEDICINE I  
4 CREDITS

This course will address the state of the art in nanotechnologies and nanomedicine, and their ongoing applications focused on addressing the challenges posed by cancer prevention, diagnosis and treatment.

This program is designed to inform cancer researchers, clinicians, bio-nano technologists, technology managers, and business developers of the state of the art in bio-nano technologies, focusing on applications of these technologies for cancer prevention, diagnosis and treatment.

NM541

NANOTECHNOLOGY II

3 CREDITS

This course will provide students with the fundamentals of computational problem-solving techniques that are used to understand and predict properties of nanoscale systems. Emphasis will be placed on how to use simulations effectively to predict properties that occur at the nanoscale for real systems. The course is designed to present a broad overview of computational Nano science and is therefore suitable for both experimental and theoretical researchers.

Prerequisite: Nanotechnology I- NM540

NM551

NANOMEDICINE II

4 CREDITS

This course will provide a comprehensive introduction to the rapidly developing field of Nanomedicine. This highly innovative, multidisciplinary course offers the latest scientific knowledge in nanotechnology based diagnostic and therapeutic applications in medicine providing revolutionary approaches in tumor nano-therapy, drug delivery Nano systems, the bio tolerability of materials, nano-sensor technology, and the use of selective Nano photodynamic therapy in cancer treatment.

Prerequisite: Nanomedicine I-NM598

NM598

NANOMEDICINE SEMINAR I

1 CREDIT

This is a science-oriented multi-disciplinary course where the student will be introduced to the nature of performing fundamental research. The student will receive training in research techniques on real life example projects. Skills include the development of sophisticated models, numerical simulation methods for solving complex problems in modern science, and experience in writing a research report.

NM599

NANOMEDICINE SEMINAR II

1 CREDIT

This course is intended to survey the field of Nano biomedicine in a lecture format given by experts in this field. Topics will range from multimodality imaging to targeted therapeutics to molecular diagnostics. Benefits and toxicities will be presented as well as the translational aspects of the commercialization of Nano systems for medical use.

NM560

RESEARCH/DESIGN SEQUENCE IN CANCER NANOMEDICINE

2 CREDITS

The main aim of this research is to study the fundamental mechanisms of the radiation interaction with biological systems containing nanostructures for selective nano-photodynamic therapy and cancer cells treatment. Proposed research topics for students will include but not be limited to:

- Surface Plasmon resonance as a cancer biomarker detection technology.
- Ultra-short laser pulse heating of nanostructures in cancer cells. Time and space simulations of the temperature fields.
- Laser-induced explosion of nanoparticles
- New Dynamic Modes in Selective Cancer Nanomedicine

Prerequisite: Statistics

NM699

CLINICAL INTERNSHIP

4 CREDITS

The student participates in a competency-based clinical internship. The internship is designed to give the student laboratory/clinical instruction in specific areas of medical physics and nanomedicine practice. The student keeps a daily journal of their progress on each of the course competencies, to include not only assigned calculations and discussions but also relevant notes and observations on clinical practice.

## FACULTY AND STAFF ADDENDUM – Volume 7 (June 8, 2016)

Radiological Technologies University  
100 E. Wayne Street, Suite 140  
South Bend, IN 46601

### Faculty and Staff

Faculty members are selected on the basis of professional experience, expertise in teaching theoretical and applied subjects, research and case study supervision capabilities, involvement in community and professional affairs, and leadership and role model capabilities essential to student advancement and professional growth.

### Faculty Listing

Brent Murphy, MS, DABR	MS Medical Physics from the University of Wisconsin Area of specialization-Medical Physics Program Chair-Medical Physics, Medical Dosimetry
Scott Dube, MS, DABR	MS Radiological Sciences from the University of Colorado Area of specialization –Medical Physics
Steve Goetsch, Ph.D.	Ph.D. University of Wisconsin Area of specialization-Medical Physics
Carl Helrich, Ph.D.	Ph.D. Northwestern University Area of specialization-Physics
Michael Stabin, Ph.D., CHP	Ph.D. University of Tennessee Area of specialization-Nuclear Engineering
Wanpeng Tan, Ph.D.	Ph.D. Michigan State University Area of specialization-Physics
Liliana Braescu, Ph.D.	Ph.D. West University of Timisoara Area of specialization-Mathematics
David Phebus, MS, CMD	MS Radiological Technologies University Area of specialization-Medical Dosimetry
Manuel Arreola, Ph.D., DABR	Ph.D. University of Florida Area of specialization-Diagnostic Medical Physics
Renat Letfullin, Ph.D.	Ph.D. Saratov State Area of specialization-Physics and Nanotechnology
Razin Ahmed, M.D.	M.D. Medical University of Silesia, Katowice, Poland Area of specialization – Medical Dosimetry

John Lowden, MS, DABR, CMD	MS Purdue University Area of specialization-Medical Physics
Nichole LaMaster, D.C.	BS Indiana University D.C. Logan College of Chiropractic Area of specialization-Human Anatomy & Physiology
David Trump, Ph.D.	Ph.D. Purdue University Area of specialization-Medicinal Chemistry
Alan Fellman, Ph.D., CHP	Ph.D. New York University M.P.H. University of Michigan Area of Specialization-Health Physics
Mellonie Brown, M.E.T., CMD, R.T.(T.)	M.E.T. Boise State University BS Medical University of South Carolina BS Erskine College Area of Specialization-Radiation Therapy and Dosimetry
David Good, MS	MS Duke University Area of specialization-Medical Physics
Nadeem Khan, MS, DABR	MS University of Toledo Area of specialization-Medical Physics
Micah Hamanaka, Ph.D.	Ph.D. Northwestern University MS University of Notre Dame Area of specialization-Biomedical Engineering

**Staff Listing**

Brent Murphy, MS, DABR	President
Elizabeth Datema, BS	Director of Administrative Services
Linda Murphy, BS	Director of Recruitment
Kuralay Kussainova, MS	Recruiter, Marketing Assistant, International Relations
Barbara Wallace, MLS	Librarian
Debra Merley	Administrative Assistant

**Professional Services**

Accounting:	Steven A. Goldberg, CPA Cullar & Associates PC
Legal:	Taft Stettinius & Hollister, LLP

Legal control of the organization is through the primary membership of the limited liability corporation which is controlled by Brent D. Murphy. Brent Murphy is the sole member.